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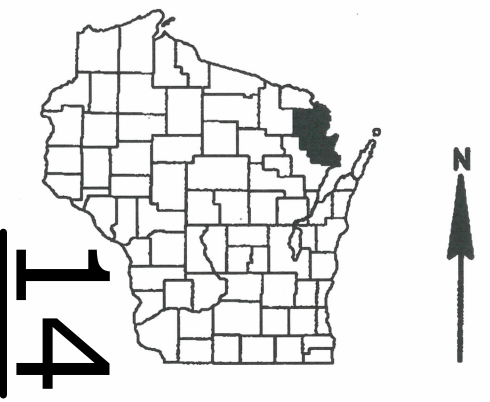
JUL 2016

PROJECT ID: 1590-21-71
WITH: NA

COUNTY: MARINETTE

ORDER OF SHEETS

Section No. 1	Title
Section No. 2	Typical Sections and Details (Includes erosion control)
Section No. 3	Estimate of Quantities
Section No. 3	Miscellaneous Quantities
Section No. 4	Right of Way Plat
Section No. 5	Plan
Section No. 6	Standard Detail Drawings
Section No. 7	Sign Plates
Section No. 8	Structure Plans
Section No. 9	Computer Earthwork Data
Section No. 9	Cross Sections
TOTAL SHEETS = 54	



DESIGN DESIGNATION

A.A.D.T. (2016)	=	960
A.A.D.T. (2036)	=	1100
D.H.V.	=	110
D.D.	=	61/39
T.	=	15.2
DESIGN SPEED	=	55 MPH
ESALS	=	NA

CONVENTIONAL SYMBOLS

PLAN	
CORPORATE LIMITS	
PROPERTY LINE	
LOT LINE	
LIMITED HIGHWAY EASEMENT	
EXISTING RIGHT OF WAY	
PROPOSED OR NEW R/W LINE	
SLOPE INTERCEPT	
REFERENCE LINE	
EXISTING CULVERT	
PROPOSED CULVERT (Box or Pipe)	
COMBUSTIBLE FLUIDS	
MARSH AREA	
WOODED OR SHRUB AREA	
WETLAND IMPACT AREA	

PROFILE	
GRADE LINE	
ORIGINAL GROUND	
MARSH OR ROCK PROFILE (To be noted as such)	
SPECIAL DITCH	
GRADE ELEVATION	
CULVERT (Profile View)	
UTILITIES	
ELECTRIC	
FIBER OPTIC	
GAS	
SANITARY SEWER	
STORM SEWER	
TELEPHONE	
WATER	
UTILITY PEDESTAL	
POWER POLE	
TELEPHONE POLE	

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

T DUNBAR, CTH U

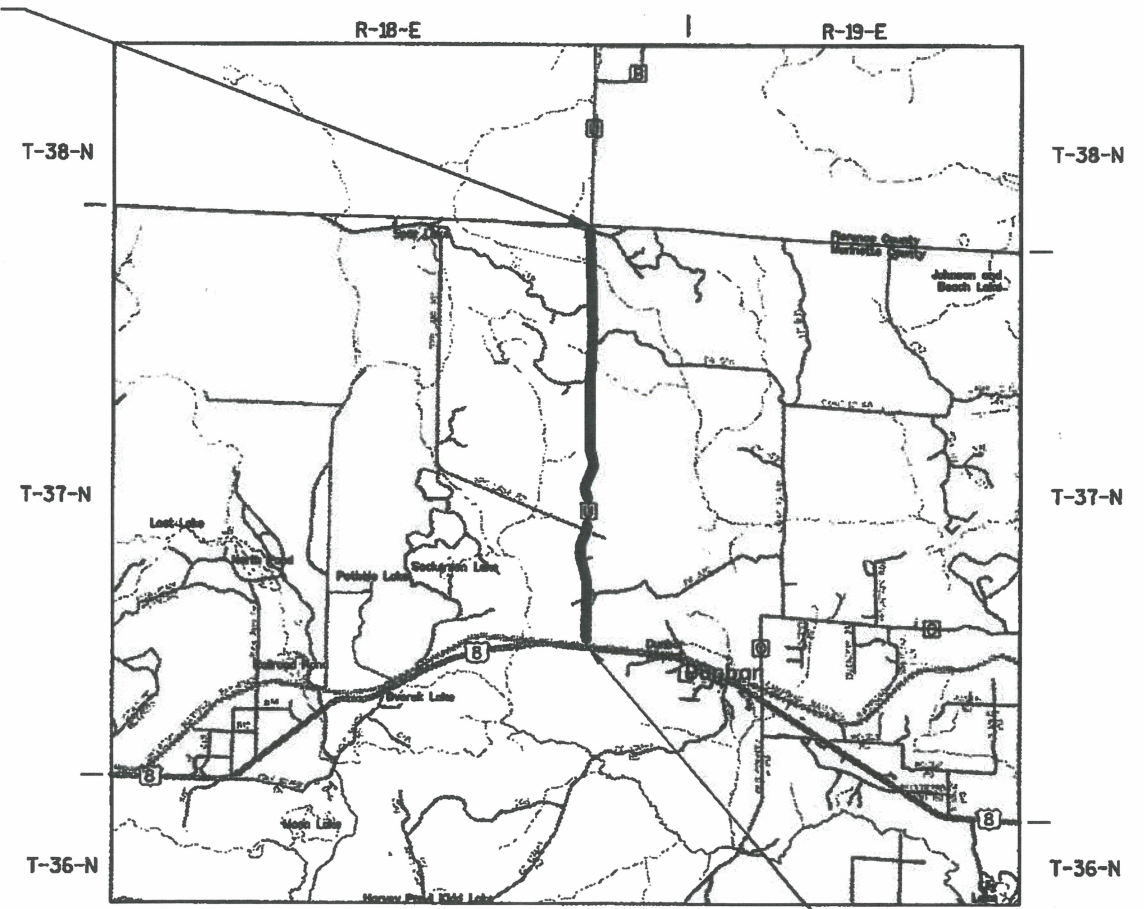
USH 8 - FLORENCE COUNTY LINE

CTH U

MARINETTE COUNTY

STATE PROJECT NUMBER
1590-21-71

END PROJECT
STA. 256+75.00



BEGIN PROJECT
STA. 21+00.00
N = 351483.37
E = 658196.27

LAYOUT
SCALE 0 2 MILE

TOTAL NET LENGTH OF CENTERLINE = 4.465 MILES

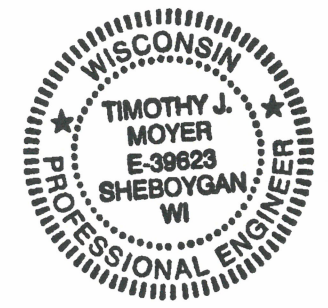
HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COUNTY COORDINATES, MARINETTE COUNTY, NAD83 (2011), IN U.S. SURVEY FEET. VALUES ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES.

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
PROJECT ID		
1590-21-71	WISC 2016253	1

ACCEPTED FOR
MARINETTE COUNTY

12/14/15
(Date) (Signature & Title of Official)

ORIGINAL PLANS PREPARED BY



12/15/2015
(Date) (Signature)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY	
Surveyor	TERRATEC ENGINEERING, LLC
Designer	DONOHUE & ASSOCIATES, INC.
Management Consultant	JT ENGINEERING, INC.
C.O. Supervisor	

APPROVED FOR THE DEPARTMENT
DATE: 1/21/16
(Signature)
Management Consultant Signature
JT ENGINEERING, INC.

GENERAL NOTES:

ALL DISTURBED AREAS WITHIN THE SLOPE INTERCEPTS SHALL BE RESTORED WITH TOPSOIL, SEED, FERTILIZER AND EROSION MAT AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. ANY OTHER DISTURBED AREAS ARE TO BE SEEDED, FERTILIZED AND EROSION MATTED AT THE CONTRACTORS EXPENSE.

STATION, OFFSET FOR MGS GUARDAIL IS TO THE FACE OF RAIL. THE LENGTH OF MGS GUARDRAIL SHALL BE ADJUSTED AS NECESSARY TO ACCOMMODATE 12.5-FOOT SEGMENTS.

THE EXACT LOCATION AND OFFSETS FOR SIGNS SHALL BE COORDINATED WITH THE ENGINEER IN THE FIELD PRIOR TO INSTALLATION.

ALL DISTANCES ARE GROUND DISTANCES. TIES ARE HORIZONTAL UNLESS SHOWN OTHERWISE.

THE LOCATIONS OF EXISTING UTILITY FACILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY FACILITIES WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. NOT ALL UTILITIES ARE MEMBERS OF DIGGERS HOTLINE.

NO TREES OR SHRUBS ARE DESIGNATED FOR REMOVAL ON THE PLANS. NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT APPROVAL OF THE ENGINEER.

THE CONTROL SURVEY CONDUCTED FOR THIS PROJECT MET THIRD ORDER CONTROL SURVEY SPECIFICATIONS.

EROSION CONTROL ITEMS SHOWN IN THE PLANS AND MISCELLANEOUS QUANTITIES ARE AT SUGGESTED LOCATIONS. THE ENGINEER MAY MODIFY LOCATIONS TO FIT FIELD CONDITIONS.

KEEP ALL EQUIPMENT AND MATERIALS OUT OF ADJACENT WETLANDS AND WATERWAYS. STORAGE OF ANY MATERIAL IN WETLANDS WILL NOT BE PERMITTED.

MARINETTE COUNTY DID TEST BORINGS IN THE GUARDRAIL INSTALLATION LOCATIONS. BEDROCK WAS ENCOUNTERED AT DEPTHS OF LESS THAN 2' AT STA. 97+50 AND STA. 105+00. IT IS ANTICIPATED THAT BEDROCK MAY BE ENCOUNTERED FROM STA. 97+00 TO STA. 98+00 AND FROM STA. 104+50 TO STA. 105+50. FOLLOW SDD "MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL" FOR SETTING STEEL OR WOOD POST IN ROCK. IINCLUDE THIS COST IN UNIT PRICE FOR MGS GUARDRAIL 3 AND MGS GUARDRAIL 3K.

CONTROL

NO.	STATION	OFFSET	NORTHING	EASTING	ELEV.	DESCRIPTION
1	20+62	151' LT	351445.99	658044.74	???	WISDOT HEIGHT MODIFICAITON STATION
2	21+30	78' RT	351512.50	658274.44	1179.93	MARINETTE COUNTY CONTROL STATION 253718
3	94+69	10.5' RT	358737.44	658320.39	1192.95	MAG NAIL IN NB PAVEMENT
4	101+72	10.5' RT	359438.10	658299.78	1197.02	MAG NAIL IN NB PAVEMENT
5	113+38	9.2' RT	360556.56	658255.33	1216.26	MAG NAIL IN NB PAVEMENT

ABBREVIATIONS

ACCESS POINT/ DRIVEWAY CONNECTION	AP
ACCESS RIGHTS	AR
ACRES	AC.
AND OTHERS	ET.AL.
CENTERLINE	C/L
CERTIFIED SURVEY MAP	CSM
DOCUMENT	DOC.
HIGHWAY EASEMENT	H.E.
LAND CONTRACT	LC
MONUMENT	MON.
PAGE	P.
PERMANENT LIMITED EASEMENT	PL
PROPERTY LINE	PL
RECORDED AS	(100')
REFERENCE LINE	R/L
REMAINING	REM.
RIGHT-OF-WAY	R/W
SECTION	SEC.
SQUARE FEET	SQ.FT.

ABBREVIATIONS CONT.

STATION	STA.
TEMPORARY LIMITED EASEMENT	TLE
VOLUME	V.

UTILITIES

NSIGHT TELESERVICES
CHRIS HINES
PLANT ENGINEERING MANAGER
5475 GLENDALE AVENUE
GREEN BAY, WI 54313
PHONE: 920-865-3166
EMAIL: CHRIS.HINES@NSIGHT.COM

WISDNR

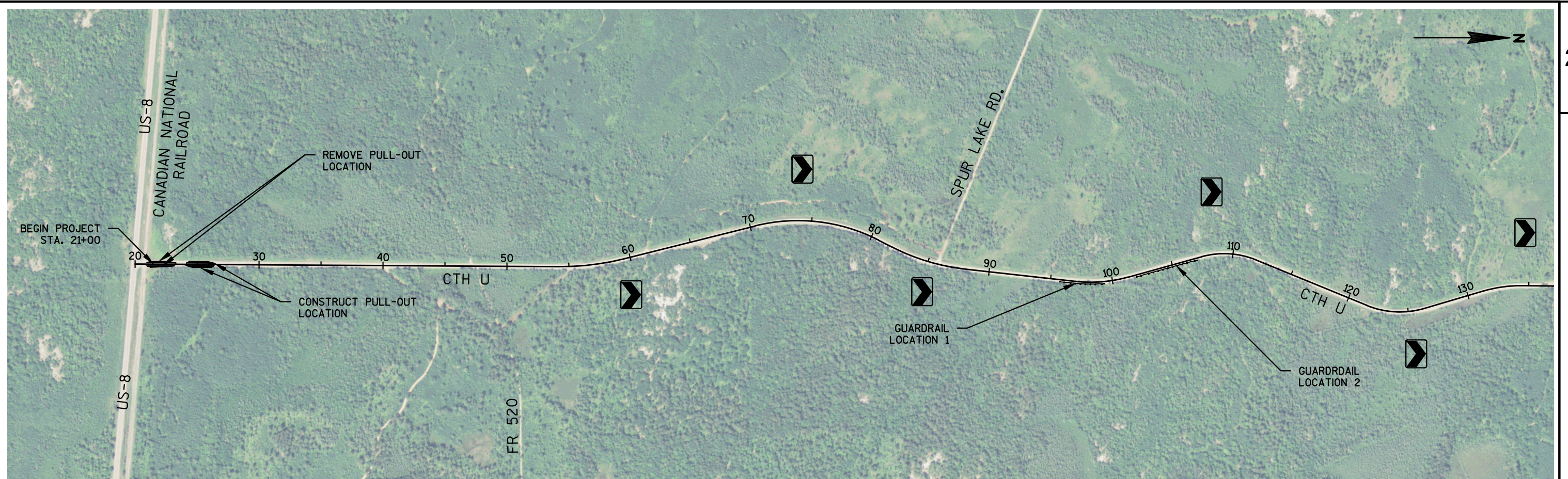
JAMES DOPERALSKI
DNR NE REGION
2984 SHAWANO AVENUE
GREEN BAY, WI 54313
PHONE: 920-662-5119
EMAIL: JAMES.DOPERALSKI@WISCONSIN.GOV



Dial 811 or (800)242-8511

www.DiggersHotline.com

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PROJECT NO: 1590-21-71

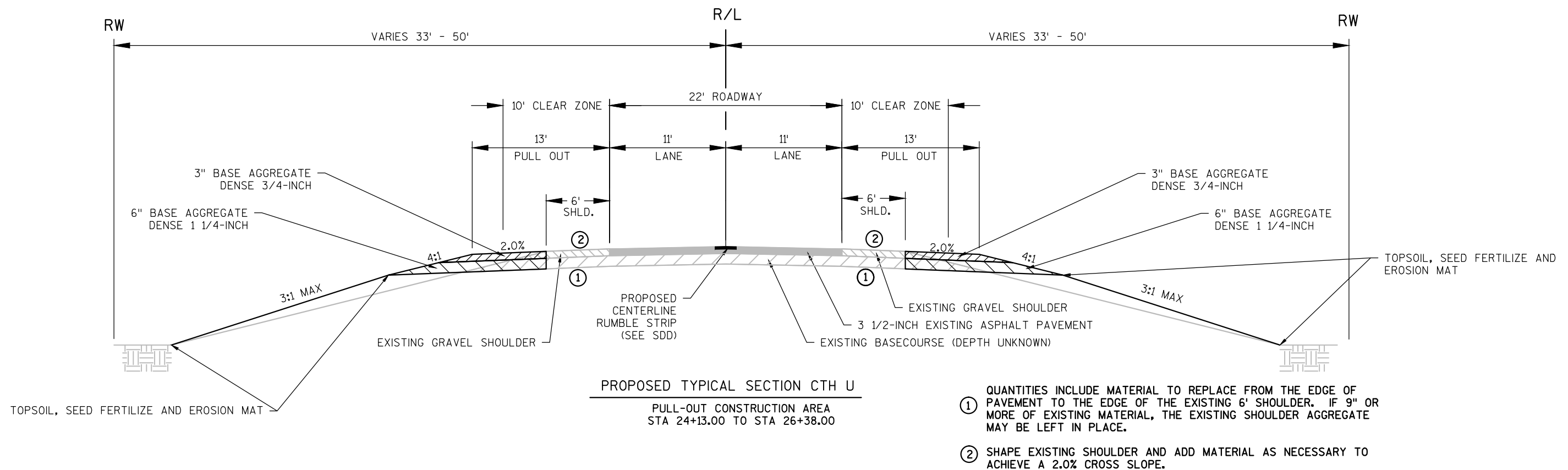
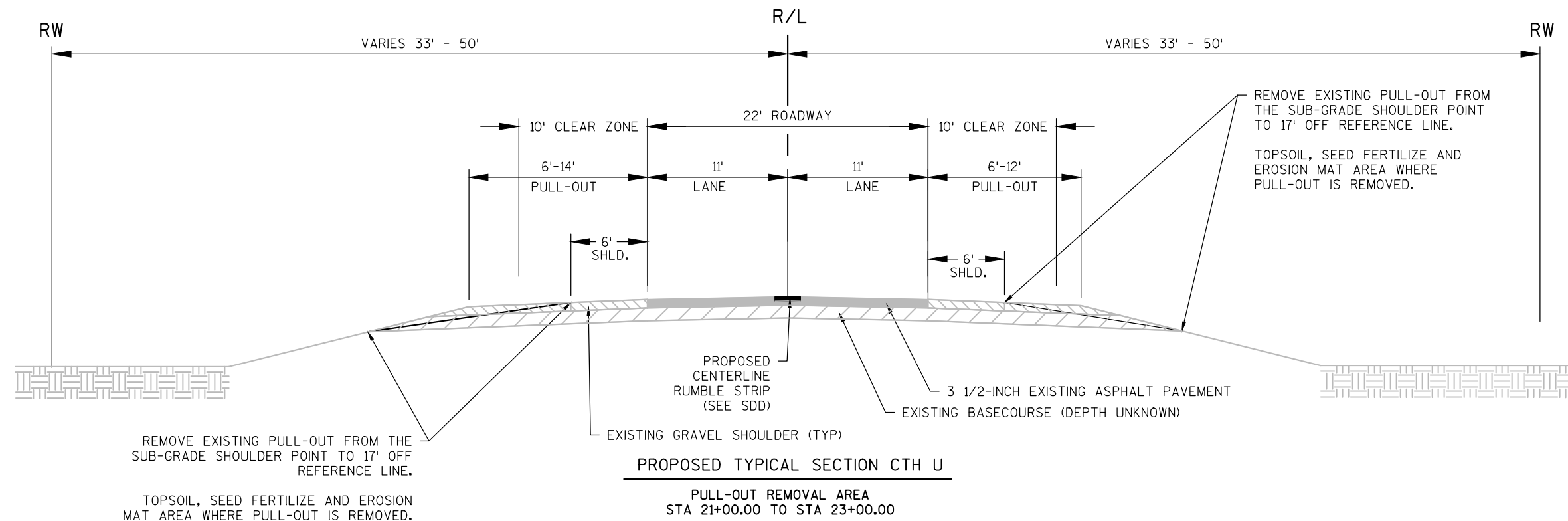
HWY: CTH U

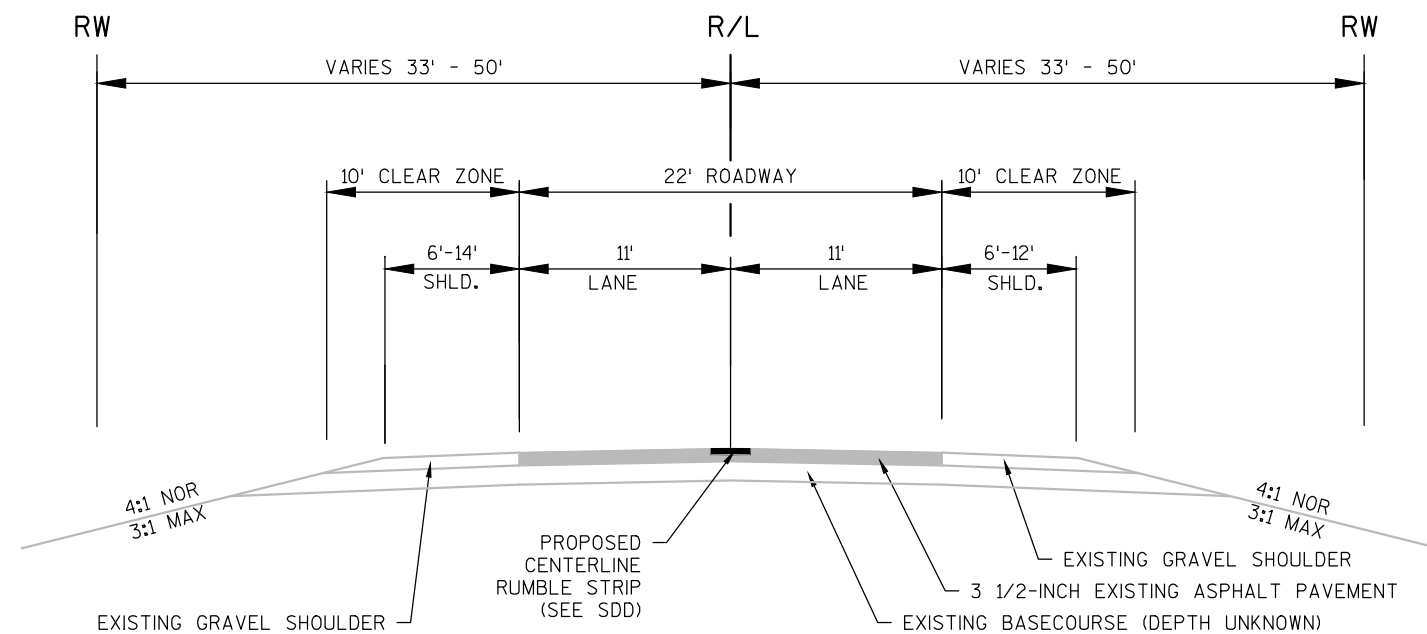
COUNTY: MARINETTE

PROJECT OVERVIEW

SHEET

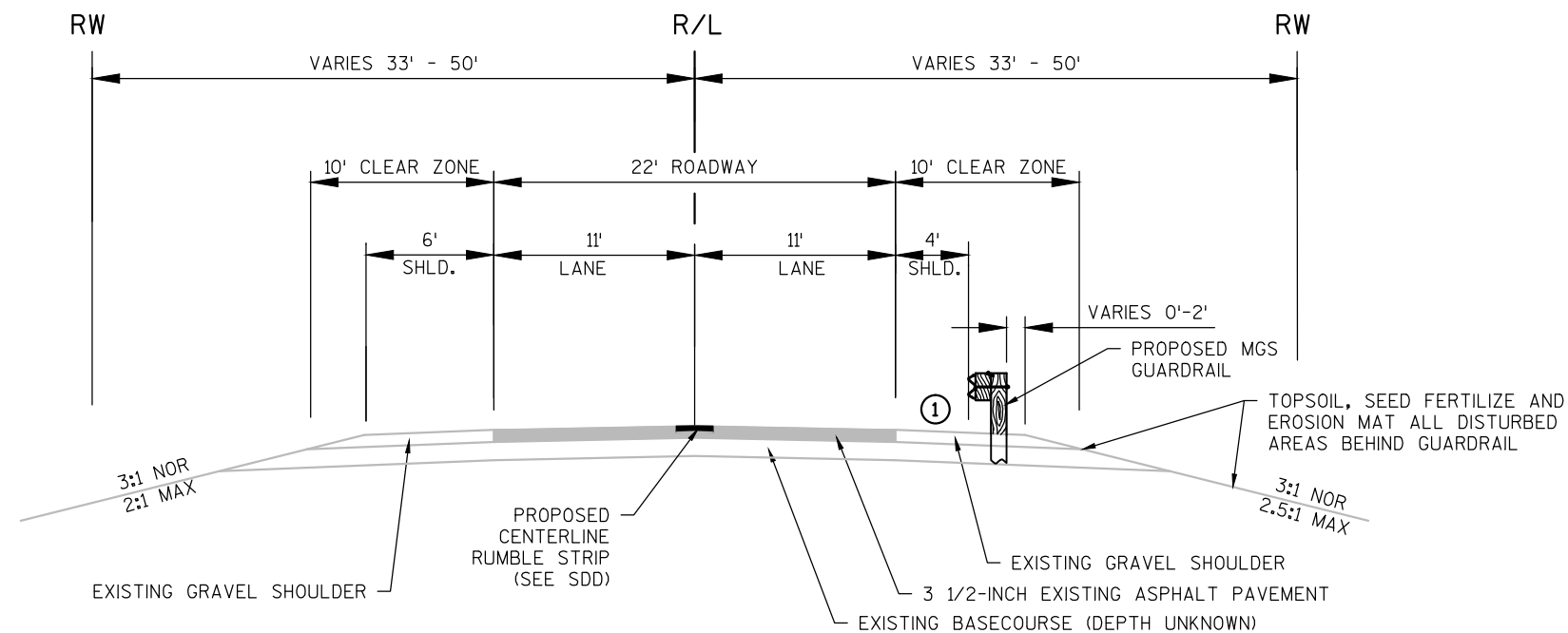
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PROPOSED TYPICAL SECTION CTH U

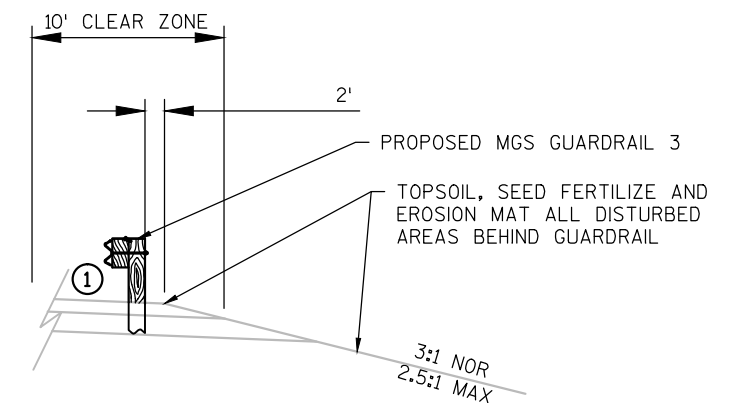
STA 23+00.00 TO STA 24+13.00
 STA 26+38.00 TO STA 95+80.00
 STA 99+30.00 TO STA 102+00.00
 STA 107+00.00 TO STA 256+75.00



PROPOSED TYPICAL SECTION CTH U

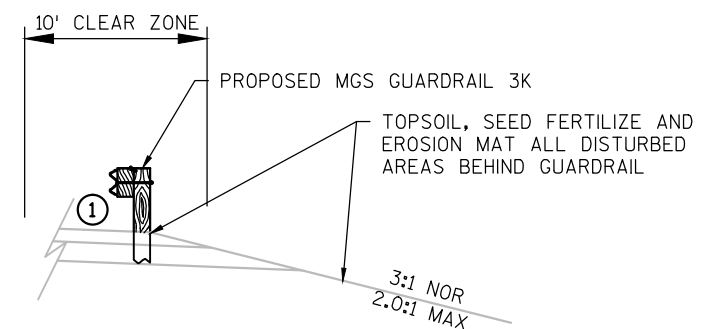
STA 95+80.00 TO STA 99+30.00
 STA 102+00.00 TO STA 107+00.00

① SHAPE EXISTING SHOULDER AND ADD MATERIAL AS NECESSARY TO ACHIEVE A 4.0% CROSS SLOPE.



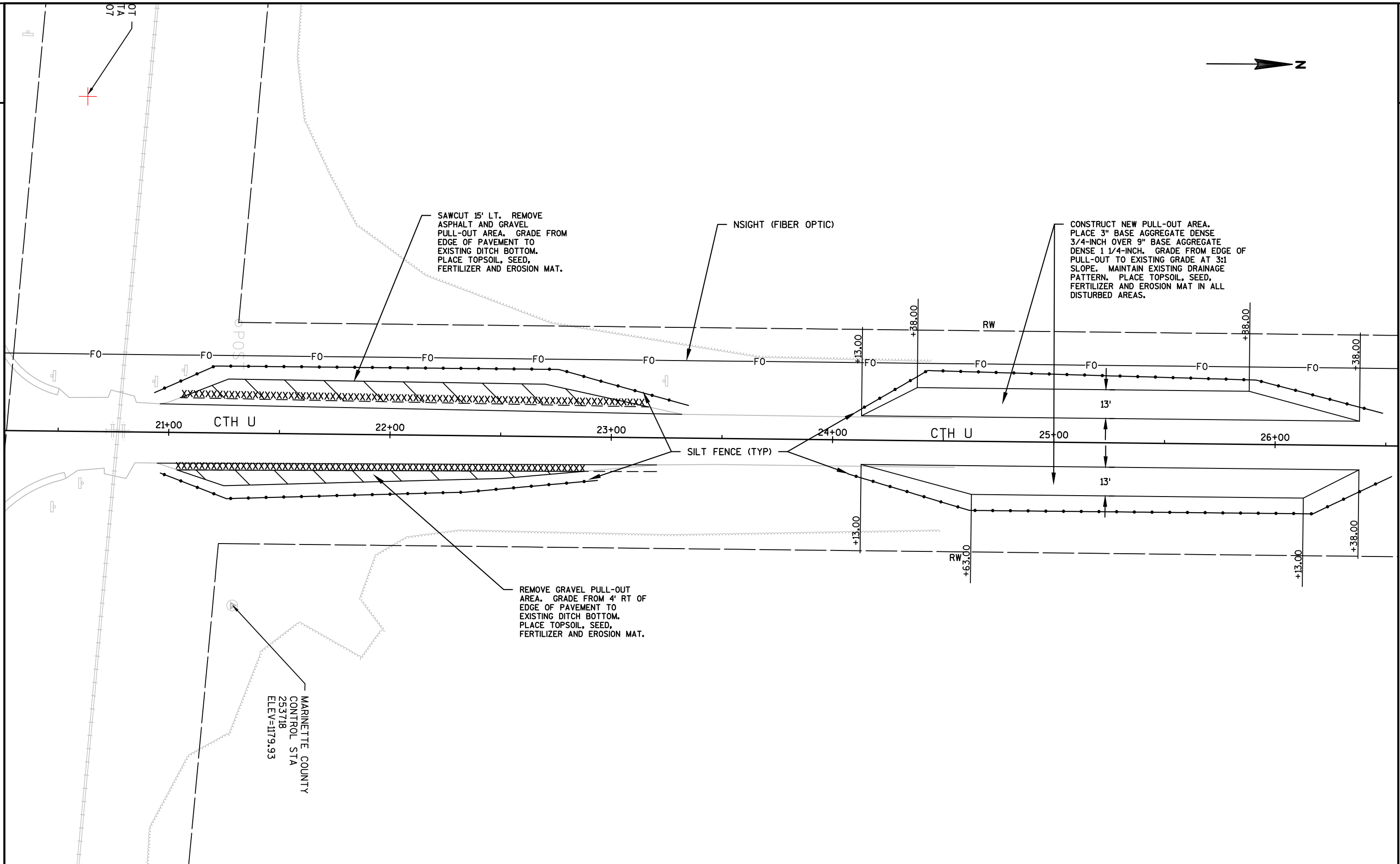
PROPOSED BEAMGUARD SECTION CTH U

STA 95+80.00 TO STA 99+30.00

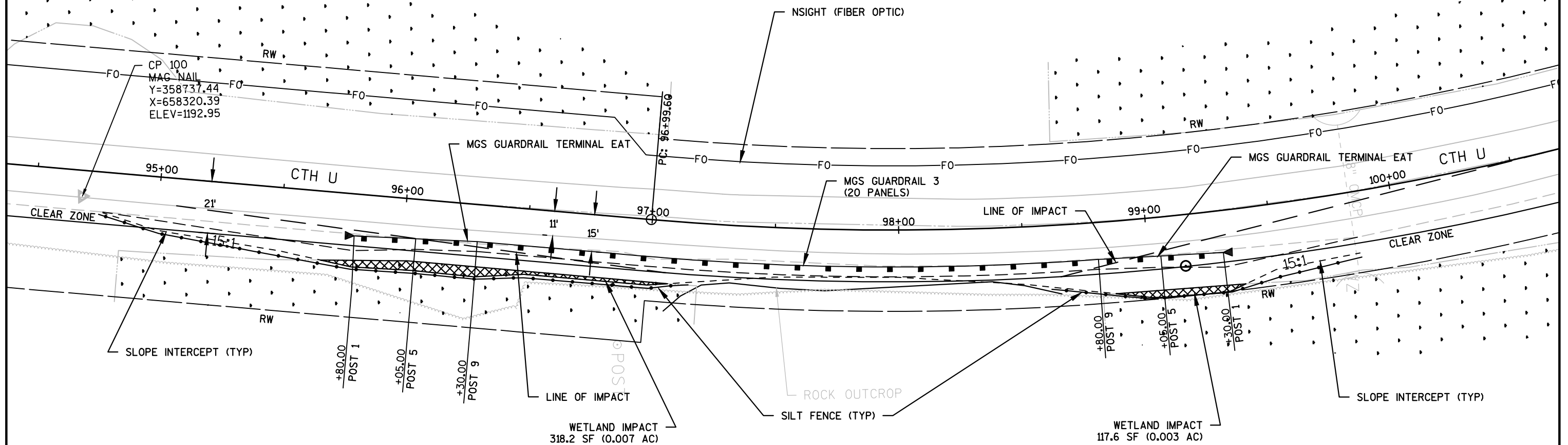


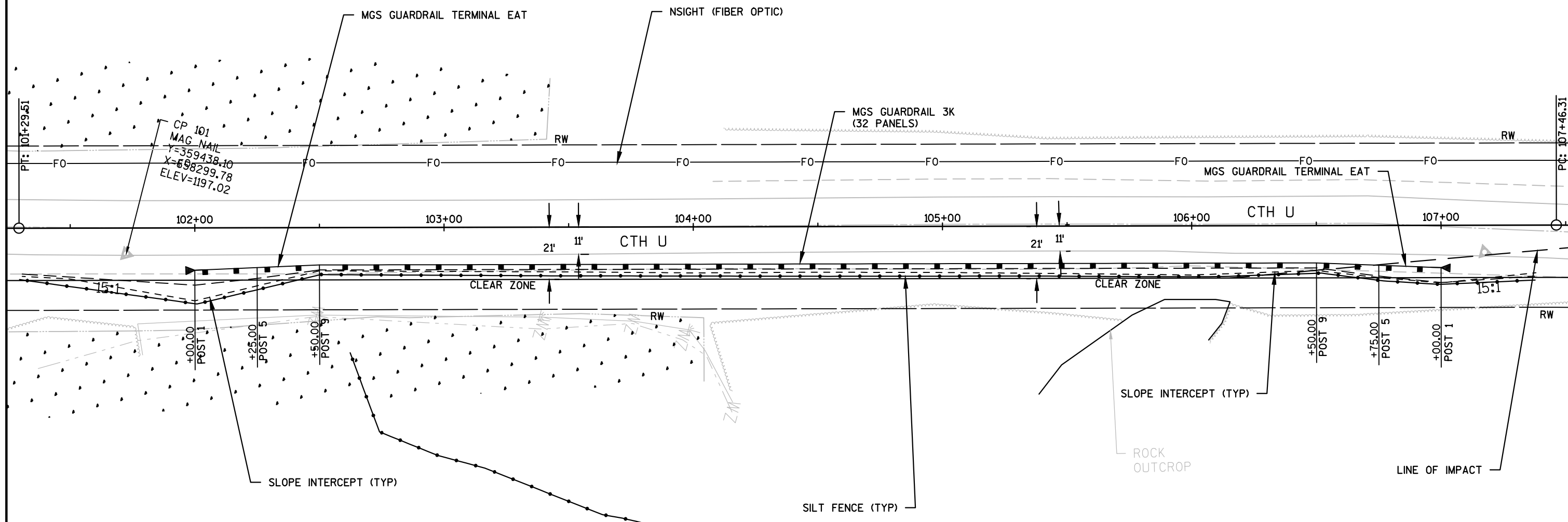
PROPOSED BEAMGUARD SECTION CTH U

STA 102+00.00 TO STA 107+00.00



PROJECT NO: 1590-21-71	HWY: CTH U	COUNTY: MARINETTE	PLAN DETAILS: SHOULDER IMPROVEMENT	SHEET	E
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DATE 13MAY16		E S T I M A T E O F Q U A N T I T I E S			
LINE					1590-21-71
NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	QUANTI TY
0010	205.0100	Excavation Common **P**	CY	342.000	342.000
0020	208.0100	Borrow **P**	CY	221.000	221.000
0030	213.0100	Finishing Roadway (project) 01. 1590-21-71	EACH	1.000	1.000
0040	305.0110	Base Aggregate Dense 3/4-Inch	TON	100.000	100.000
0050	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	275.000	275.000
0060	465.0475	Asphalt Center Line Rumble Strips 2-Lane Rural	LF	22,325.000	22,325.000
0070	614.0010	Barrier System Grading Shaping Finishing	EACH	2.000	2.000
0080	614.2300	MGS Guardrail 3	LF	250.000	250.000
0090	614.2330	MGS Guardrail 3 K	LF	400.000	400.000
0100	614.2610	MGS Guardrail Terminal EAT	EACH	4.000	4.000
0110	619.1000	Mobilization	EACH	1.000	1.000
0120	624.0100	Water	MGAL	5.000	5.000
0130	625.0100	Topsoil **P**	SY	1,500.000	1,500.000
0140	628.1504	Silt Fence	LF	2,160.000	2,160.000
0150	628.1520	Silt Fence Maintenance	LF	2,160.000	2,160.000
0160	628.1905	Mobilizations Erosion Control	EACH	1.000	1.000
0170	628.1910	Mobilizations Emergency Erosion Control	EACH	1.000	1.000
0180	628.2004	Erosion Mat Class I Type B **P**	SY	1,500.000	1,500.000
0190	628.7504	Temporary Ditch Checks	LF	120.000	120.000
0200	629.0210	Fertilizer Type B **P**	CWT	1.000	1.000
0210	630.0120	Seeding Mixture No. 20 **P**	LB	27.000	27.000
0220	634.0614	Posts Wood 4x6-Inch X 14-FT	EACH	35.000	35.000
0230	637.2230	Signs Type II Reflective F	SF	224.060	224.060
0240	638.2602	Removing Signs Type II	EACH	2.000	2.000
0250	638.3000	Removing Small Sign Supports	EACH	2.000	2.000
0260	643.0100	Traffic Control (project) 01. 1590-21-71	EACH	1.000	1.000
0270	643.0300	Traffic Control Drums	DAY	540.000	540.000
0280	643.0900	Traffic Control Signs	DAY	288.000	288.000
0290	646.0103	Pavement Marking Paint 4-Inch	LF	30,095.000	30,095.000
0300	648.0100	Locating No-Passing Zones	MI	4.455	4.455
0310	650.8000	Construction Staking Resurfacing Reference	LF	8,800.000	8,800.000
0320	650.9910	Construction Staking Supplemental Control (project) 01. 1590-21-71	LS	1.000	1.000
0330	690.0150	Sawing Asphalt	LF	400.000	400.000
0340	ASP.1TOA	On-the-Job Training Apprentice at \$5.00/HR	HRS	150.000	150.000
0350	ASP.1TOG	On-the-Job Training Graduate at \$5.00/HR	HRS	300.000	300.000

EARTHWORK SUMMARY TABLE

Division	From/To Station	Location	#205.0100 Excavation Common (1)		Salvaged/U nusable Pavement Material (4)	Available Material (5)	Unexpanded Fill	Expanded Fill (6)	Mass Ordinate +/- (7)	Waste	#208.0100 Borrow	Comment:
			Cut (2)	EBS Excavation				Factor 1.25				
1 Parking Pull-outs	21+00 - 23+25	Existing Left	105	0	0	105	25	31	74	74	0	(225' x 25' x 1')/2/27
	21+00 - 23+25	Existing Right	105	0	0	105	25	31	74	74	0	(225' x 25' x 1')/2/27
	24+13 - 26+38	New Left	66	0	0	66	200	250	-184	-184	0	(225' x 8' x 1')/27
	24+13 - 26+38	New Right	66	0	0	66	200	250	-184	-184	0	(225' x 8' x 1')/27
Grand Total			342	0	0	342	450	563	-221	-221	221	
			Total Common E	342								

- 1) Common Excavation is the sum of the Cut and EBS Excavation columns. Item number 205.0100
- 2) Salvaged/Unusable Pavement Material is included in Cut in reconstruction area.
- 3)
- 4) Salvaged/Unusable Pavement Material
- 5) Available Material = Cut - Salvaged/Unusable Pavement Material
- 6) Expanded Fill. Factor = 1.25
- Expanded Fill = (Unexpanded Fill) * Fill Factor
- 7) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material within the Division. Minus indicates a shortage of material within the Division.

BASE AGGREGATE AND WATER				
LOCATION	DESCRIPTION	ITEM NO. 305.0110	ITEM NO. 305.0120	ITEM NO. 624.0100
		BASE AGGREGATE DENSE 3/4-INCH TONS	BASE AGGREGATE DENSE 1 1/4-INCH TONS	WATER MGAL
24+13 - 26+38, LT	PULL-OUT AREA	40	120	2
24+13 - 26+38, RT	PULL-OUT AREA	40	120	2
GUARDRAIL	UNDISTRIBUTED	20	35	1
TOTALS		100	275	5

ASPHALTIC CENTERLINE RUMBLE STRIPS 2 LANE RURAL, ITEM 465.0475		
LOCATION		LF
START STATION	END STATION	
21+50.00	256+75	22325
Total		22325

GUARDRAIL											
LOCATION		DESCRIPTION	ITEM NO. 614.0100 BARRIER SYSTEM GRADING SHAPING FINISHING EACH	QUANTITIES FOR ESTIMATING INFORMAITONAL PURPOSES ONLY. PAID FOR AS PART OF ITEM NO. 614.0100 BARRIER SYSTEM GRADING SHAPING FINISHING					ITEM NO. 614.2300 MGS	ITEM NO. 614.2330 MGS	ITEM NO. 614.2610 MGS
				BORROW CY	TOPSOIL SY	EROSION MAT CLASS 1, TYPE B SY	SEED MIXTURE NO. 20 LB	FERTILIZER TYPE B CWT	GUARDRAIL 3 L.F.	GUARDRAIL 3K L.F.	GUARDRAIL TERMINAL EAT EACH
START STATION	END STATION										
95+80.00	99+30.00	LOCATION 1	1	130	560	560	12	0.35	250	---	2
102+00.00	107+00.00	LOCATION 2	1	20	140	140	3	0.10	---	400	2
TOTALS			2	150	700	700	15	0.45	250	400	4

TOPSOIL, SEED, FERTILZER AND EMAT				
	ITEM NO. 625.0100 TOPSOIL *	ITEM NO. 628.2004 EROSION MAT CLASS 1 TYPE B *	ITEM NO. 629.0210 FERTILIZER TYPE B *	ITEM NO. 630.0120 SEEDING MIXTURE NO. 20 *
LOCATION	S.Y.	S.Y.	CWT	LB
21+00 - 23+25, LT	500	500	0.35	9.0
21+00 - 23+25, RT	500	500	0.35	9.0
24+13 - 26+38, LT	250	250	0.15	4.5
24+13 - 26+38, RT	250	250	0.15	4.5
TOTALS	1500	1500	1.00	27

* - PAY PLAN QUANTITY

EROSION CONTROL ITEMS			
	ITEM NO. 628.1504 SILT FENCE	ITEM NO. 628.1520 SILT FENCE MAINTENANCE	ITEM NO. 628.7504 TEMPORARY DITCH CHECKS
LOCATION	L.F.	L.F.	L.F.
21+00 - 23+25, LT	REMOVED PULL OUT AREA	250	20
21+00 - 23+25, RT	REMOVED PULL OUT AREA	250	20
24+13 - 26+38, LT	NEW PULL OUT AREA	250	20
24+13 - 26+38, RT	NEW PULL OUT AREA	270	20
95+00 - 99+85, RT	GUARDRAIL LOCATION 1	525	20
103+325 - 107+00, RT	GUARDRAIL LOCATION 2	615	20
TOTALS	2160	2160	120

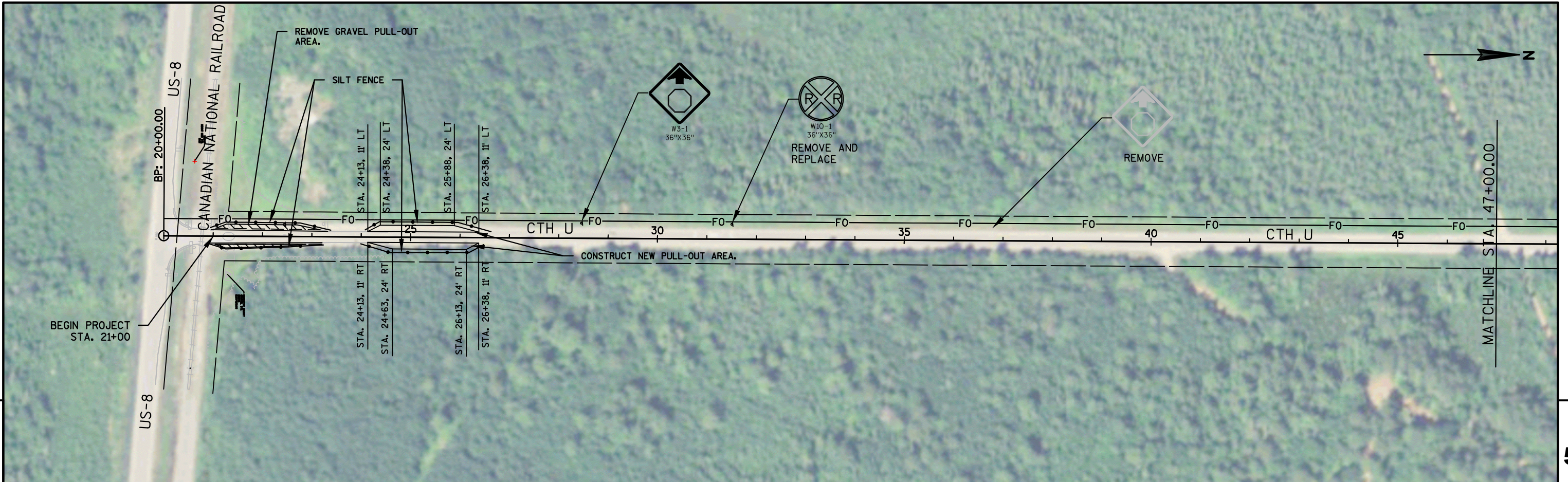
TRAFFIC CONTROL DRUMS AND SIGNS					
LOCATION	DAYS	ITEM NO. 643.0300		ITEM NO. 643.0900	
		TRAFFIC CONTROL DRUMS		TRAFFIC CONTROL SIGNS	
		EACH	DAYS	EACH	DAYS
UNDISTRIBUTED	18	30	540	16	288
TOTALS			540		288

CONSTRUCTION STAKING RESURFACING REFERENCE, ITEM NO. 650.8000		
LOCATION	DESCRIPTION	LF
21+00 - 27+00	PULL-OUT AREA	600
54+00 - 136+00	SIGNING AND GUARDRAIL LOCATIONS	8200
TOTALS		8800

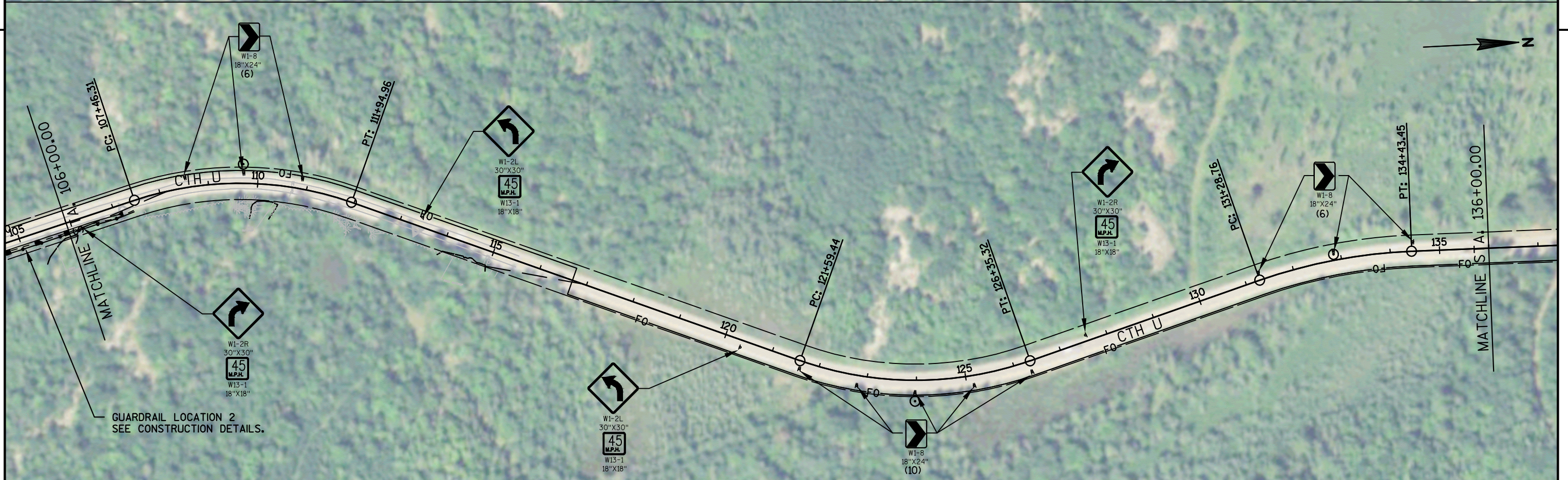
SIGNS AND POSTS							
STATION	CODE	SIZE IN. X IN.	ITEM NO. 634.0614 POSTS WOOD 4X6-INCH X 14 FEET EACH	ITEM NO. 637.2230 SIGNS TYPE 2 REFLECTIVE F S.F.	ITEM NO. 638.2602 REMOVING SIGNS TYPE 2 EACH	ITEM NO. 638.3000 REMOVING SMALL SIGN SUPPORTS S.F.	REMARKS
28+50	W3-1	36X36	1	9.00	---	---	---
31+50	W10-1	36X36	1	7.06	1	1	REMOVE OLD RR XING SIGN
36+50	---	---	---	---	1	1	REMOVE OLD STOP AHEAD SIGN
55+25	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
56+85	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
58+45	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
70+70	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
72+30	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
73+90	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
75+50	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
77+10	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
78+70	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
80+30	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
81+80	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
83+40	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
85+00	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
86+60	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
88+20	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
97+55	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
99+15	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
100+75	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
107+20	W1-2R	30X30	1	6.25	---	---	45 MPH (MOUNT UNDER W1-2R)
	W13-1	18X18	---	2.25			
108+50	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
109+70	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
110+90	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
107+20	W1-2L	30X30	1	6.25	---	---	45 MPH (MOUNT UNDER W1-2L)
	W13-1	18X18	---	2.25			
120+35	W1-2L	30X30	1	6.25	---	---	45 MPH (MOUNT UNDER W1-2L)
	W13-1	18X18	---	2.25			
121+60	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
122+80	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
124+00	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
125+20	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
126+40	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
127+65	W1-2R	30X30	1	6.25	---	---	45 MPH (MOUNT UNDER W1-2R)
	W13-1	18X18	---	2.25			
131+25	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
132+85	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
134+45	W1-8	18X24	1	6.00	---	---	2 SIGNS (3 SF EACH)
TOTALS			35	224.06	2	2	

PAVEMENT MARKING			
LOCATION		DESCRIPTION	ITEM # 646.0103 PAVEMENT MARKING PAINT 4-INCH YELLOW
			LF
START STATION	END STATION		
21+50.00	21+80.00	DOUBLE YELLOW	60
21+80.00	28+12.00	ONE DIRECTION PASS	794.5
28+12.00	46+87.00	TWO DIRECTION PASS	475
46+87.00	56+87.00	ONE DIRECTION PASS	1250
56+87.00	151+20.00	DOUBLE YELLOW	18866
151+20.00	162+65.00	ONE DIRECTION PASS	1432.5
162+65.00	190+88.00	TWO DIRECTION PASS	712.5
190+88.00	210+00.00	ONE DIRECTION PASS	2390
210+00.00	213+43.00	TWO DIRECTION PASS	87.5
213+43.00	221+00.00	ONE DIRECTION PASS	944.5
221+00.00	239+45.00	TWO DIRECTION PASS	462.5
239+45.00	250+60.00	ONE DIRECTION PASS	1390
250+60.00	256+75.00	DOUBLE YELLOW	1230
Total			30095

SAWING ASPHALT, ITEM NO. 690.0150	
LOCATION	ITEM NO. 690.0150
	LF
21+00 - 23+00, LT	200
21+00 - 23+00, RT	200
TOTALS	400



PROJECT NO: 1590-21-71	HWY: CTH U	COUNTY: MARINETTE	PLAN	SHEET	E
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PROJECT NO: 1590-21-71	HWY: CTH U	COUNTY: MARINETTE	PLAN	SHEET	E
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5



5



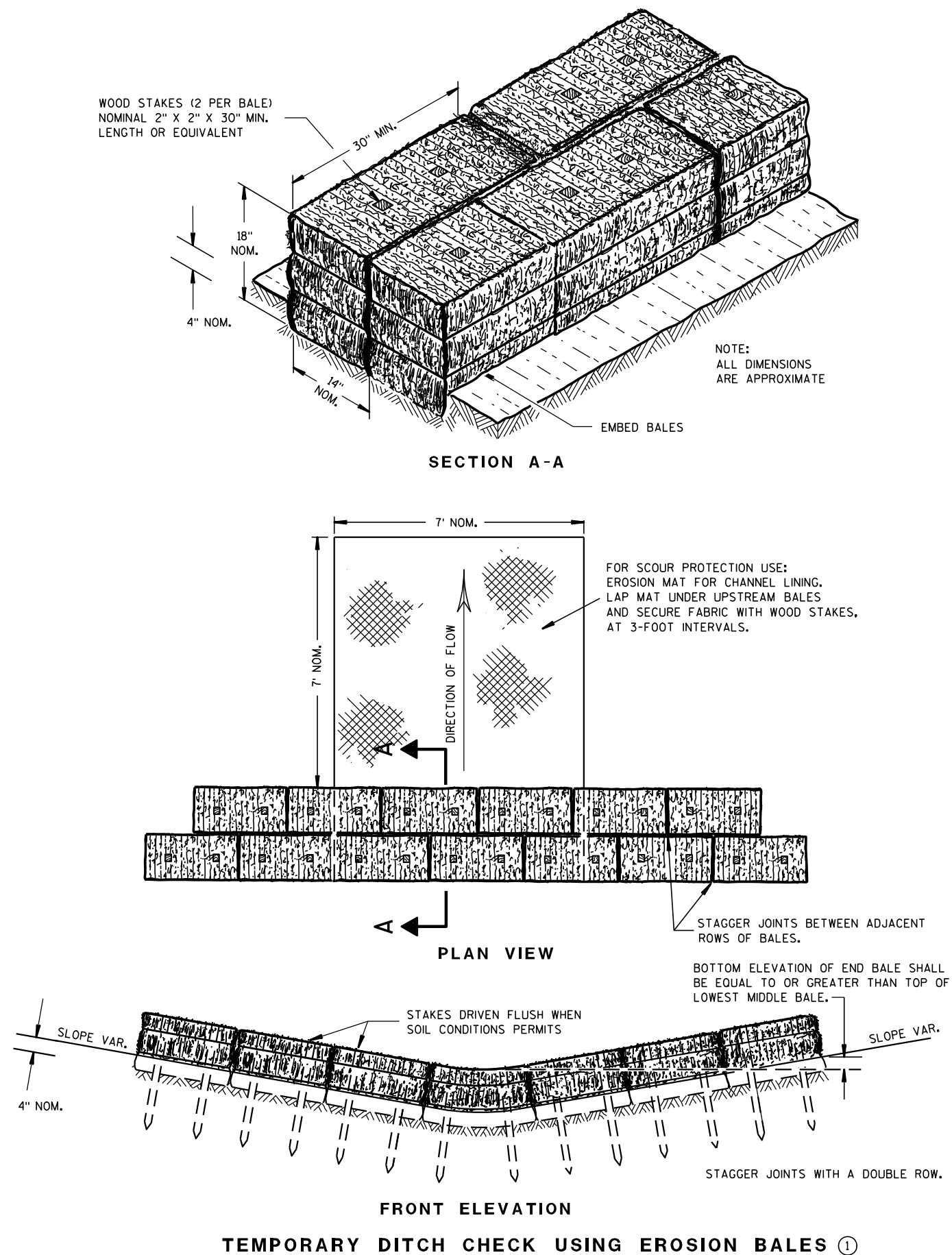
PROJECT NO: 1590-21-71	HWY: CTH U	COUNTY: MARINETTE	PLAN	SHEET	E
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PROJECT NO: 1590-21-71	HWY: CTH U	COUNTY: MARINETTE	PLAN	SHEET	E
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Standard Detail Drawing List

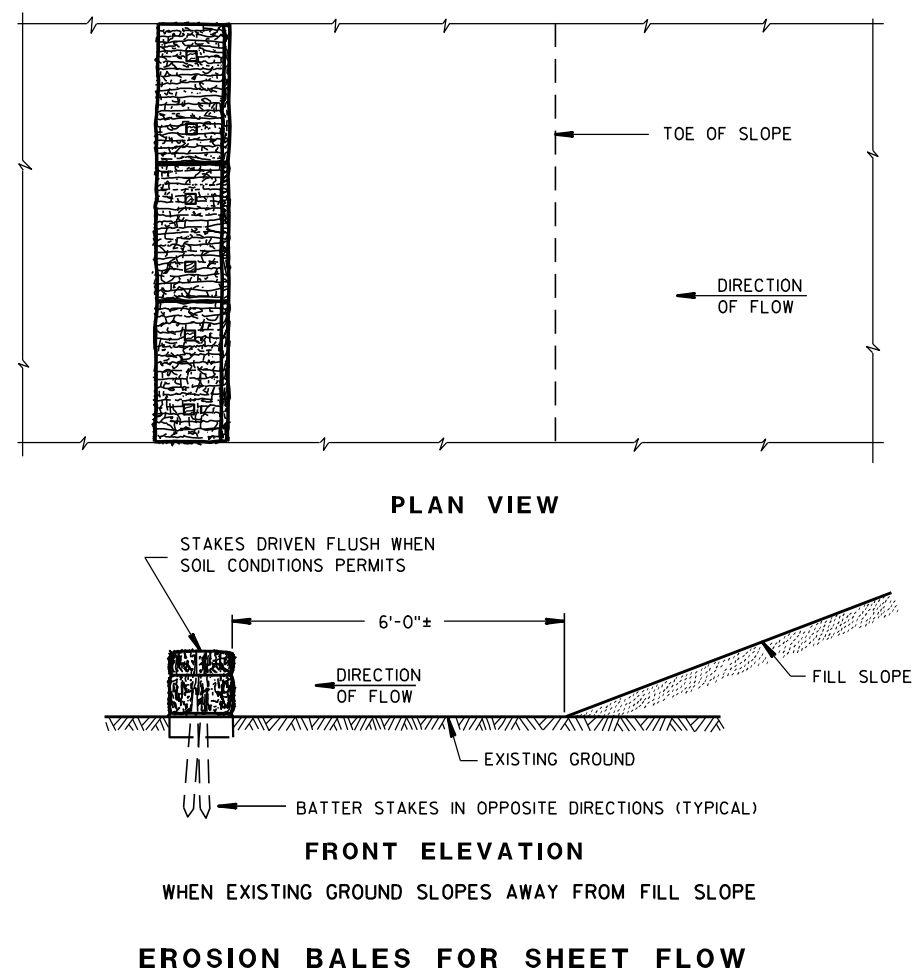
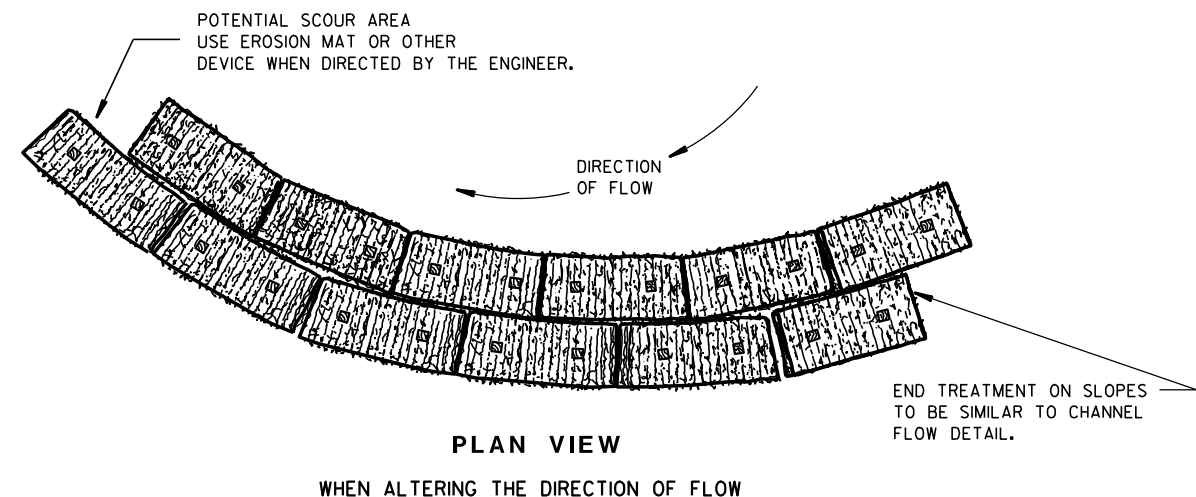
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
13A11-02A	2-LANE RURAL CENTER LINE RUMBLE STRIP, MILLING
13A11-02B	2-LANE RURAL CENTER LINE RUMBLE STRIP, MILLING
14B42-03A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-03B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-03C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-02A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-02B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-02C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
15C08-16A	PAVEMENT MARKING (MAINLINE)
15C12-04	TRAFFIC CONTROL FOR LANE CLOSURE (SUITABLE FOR MOVING OPERATIONS)
15C19-03A	MOVING PAVEMENT MARKING OPERATION TWO-LANE TWO-WAY ROADWAY
15D28-03	TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY



GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- ① TEMPORARY DITCH CHECKS EITHER EROSION BALES OR MANUFACTURED SHALL BE PAID FOR UNDER THE BID ITEM OF TEMPORARY DITCH CHECK. THE DEPARTMENT WILL NOT PAY FOR TEMPORARY DITCH CHECKS CONSTRUCTED OF A SINGLE ROW OF EROSION BALES.



TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

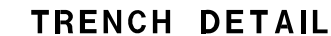
6/04/02
DATE

/S/ Beth Canestra
CHIEF ROADWAY DEVELOPMENT ENGINEER

FHWA



- ① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
- ② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
- ③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" X 1 1/8" OF OAK OR HICKORY.
- ④ SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
- ⑤ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



SILT FENCE

**STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION**

APPROVED
4-29-05 /s/ Beth Canestra
DATE **CHIEF ROADWAY DEVELOPMENT ENGINEER**

FHWA

GENERAL NOTES

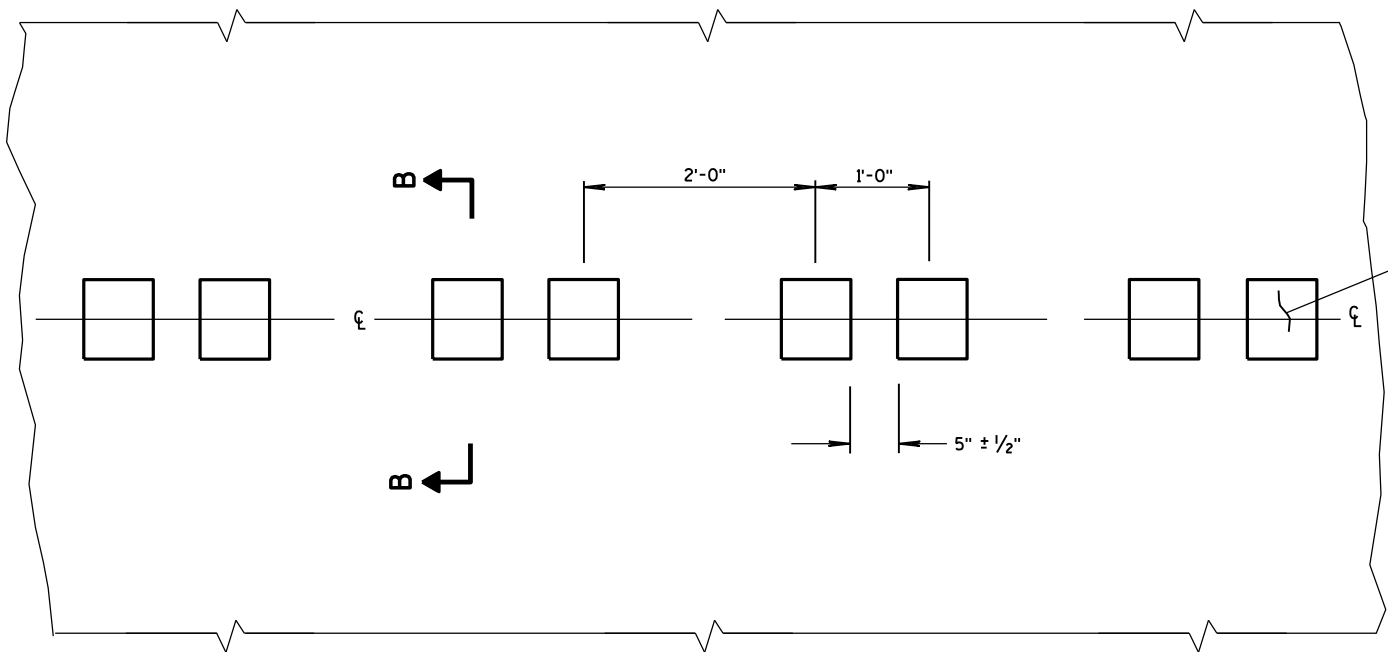
DETAILS OF CONSTRUCTION SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

DO NOT MILL CENTER LINE GROOVES THROUGH ANY INTERSECTION, MARKED CROSSWALK, NON-MOTORIZED PATH CROSSING, OR SNOWMOBILE CROSSING.

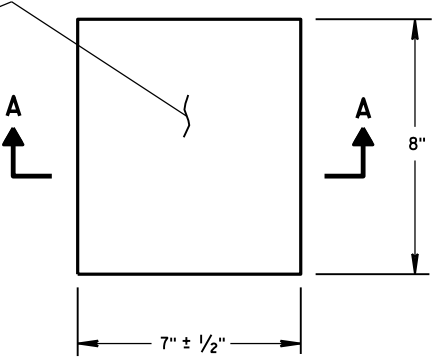
INSTALL PAVEMENT MARKING AFTER THE GROOVES ARE INSTALLED.

SEE SIGNING PLAN FOR SIGN REQUIREMENTS THAT MAY BE NEEDED.

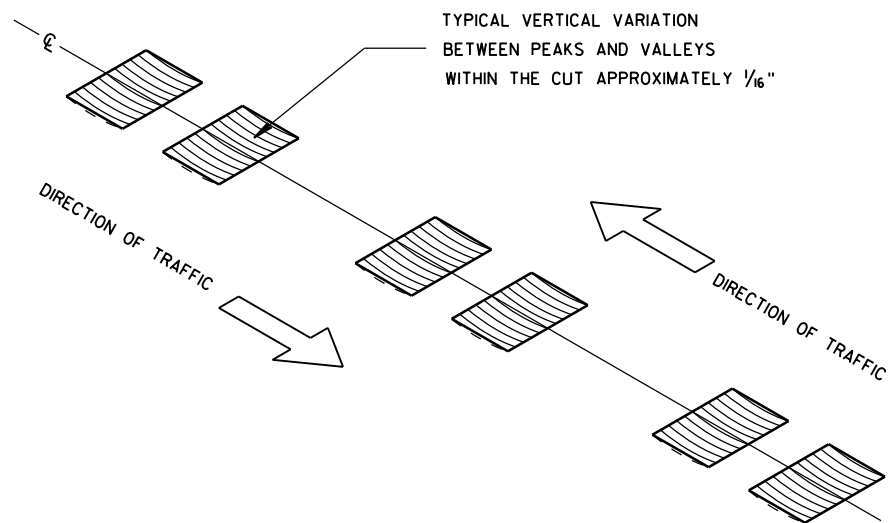
① CENTERLINE GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS, WHEN DIRECTED BY THE ENGINEER.



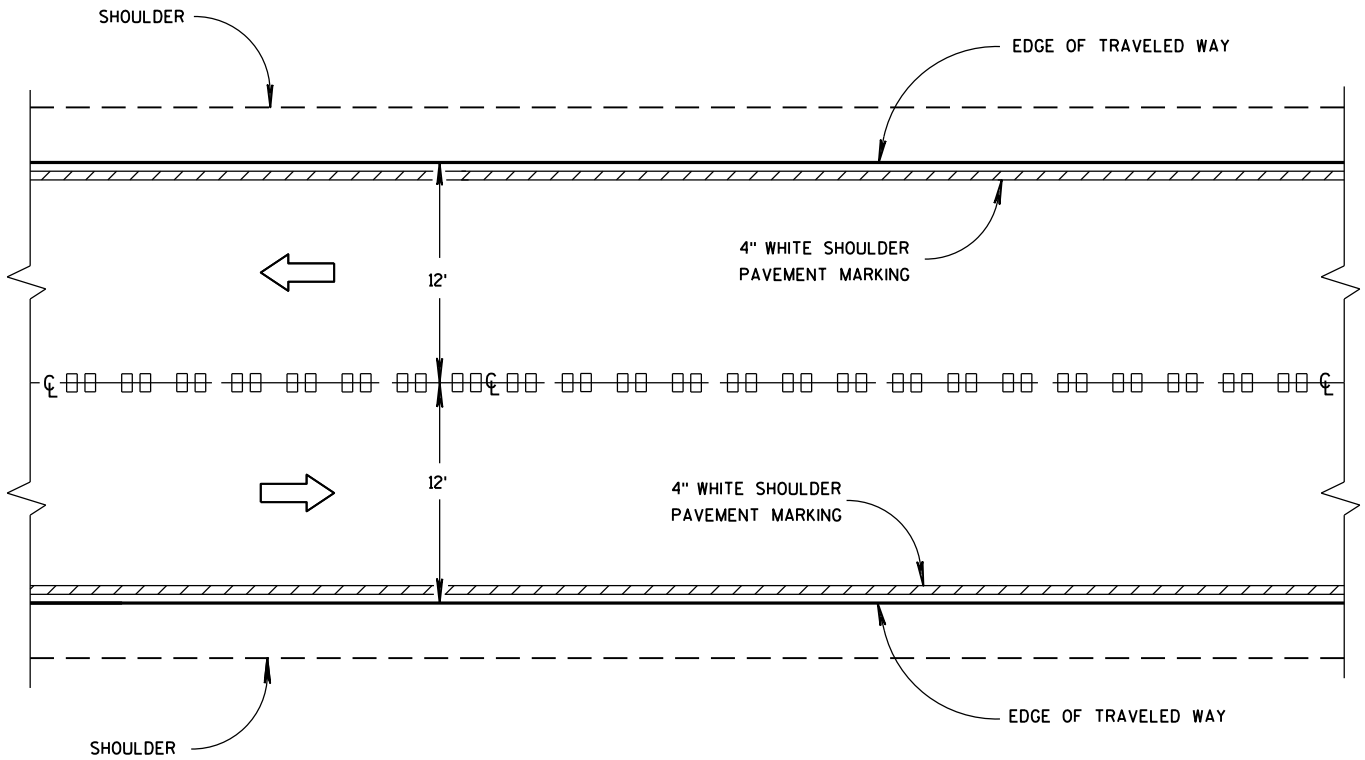
PLAN VIEW
CENTER LINE WITH GROOVES



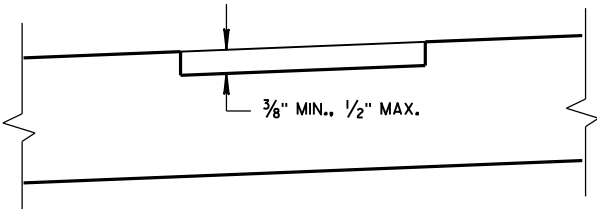
PLAN VIEW
(SINGLE GROOVE)



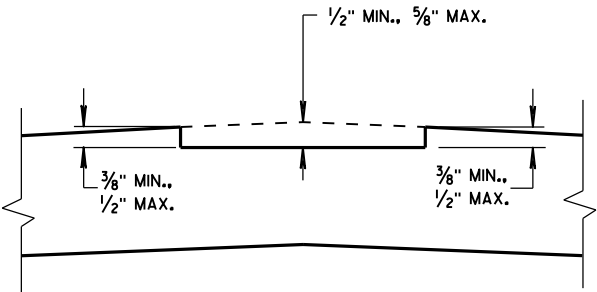
ISOMETRIC



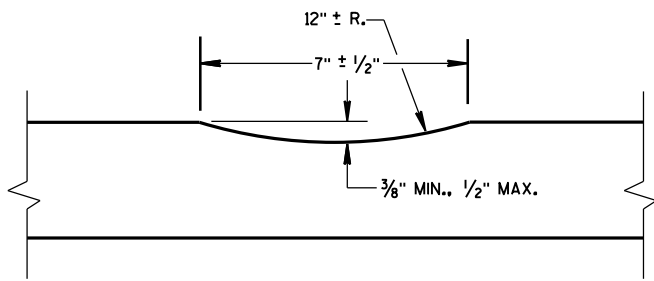
CENTER LINE GROOVES ON TWO-WAY ROADWAYS



SECTION B-B
SUPERELEVATED ROADWAY



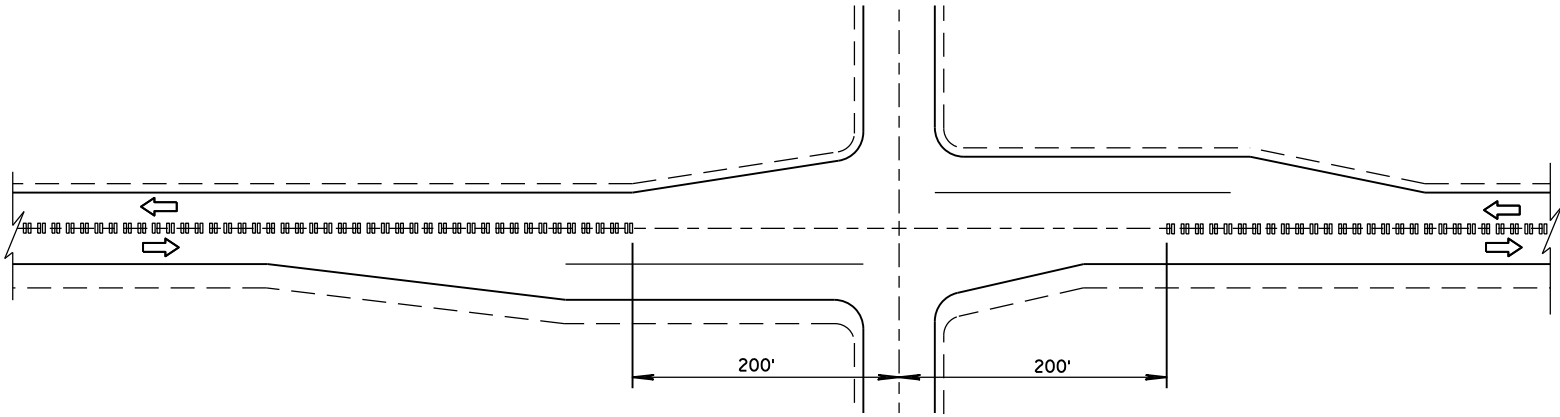
SECTION B-B
CROWNED ROADWAY



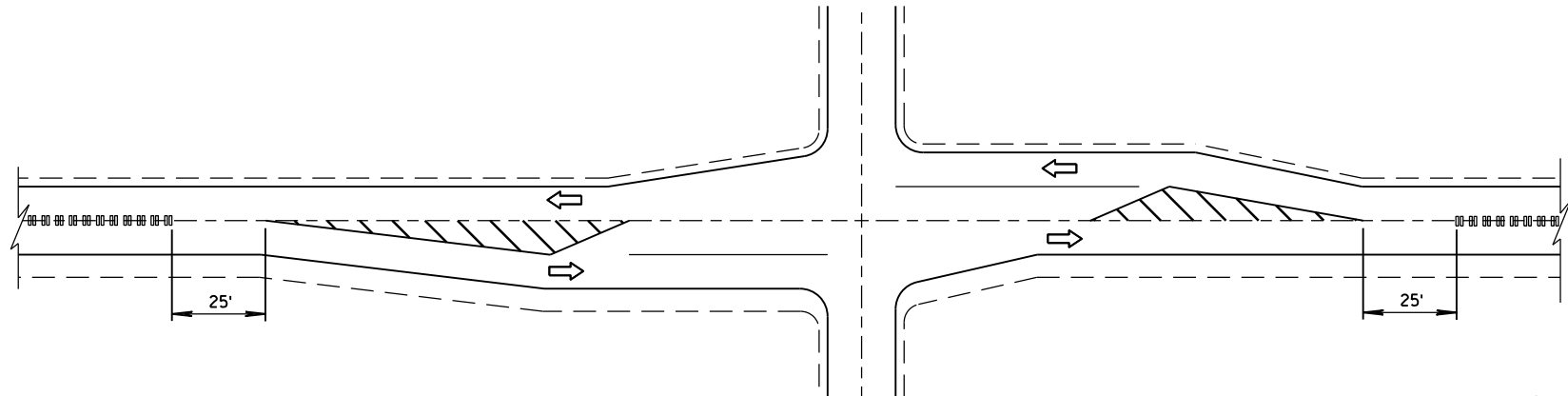
SECTION A-A

2-LANE RURAL
CENTER LINE RUMBLE STRIP,
MILLING

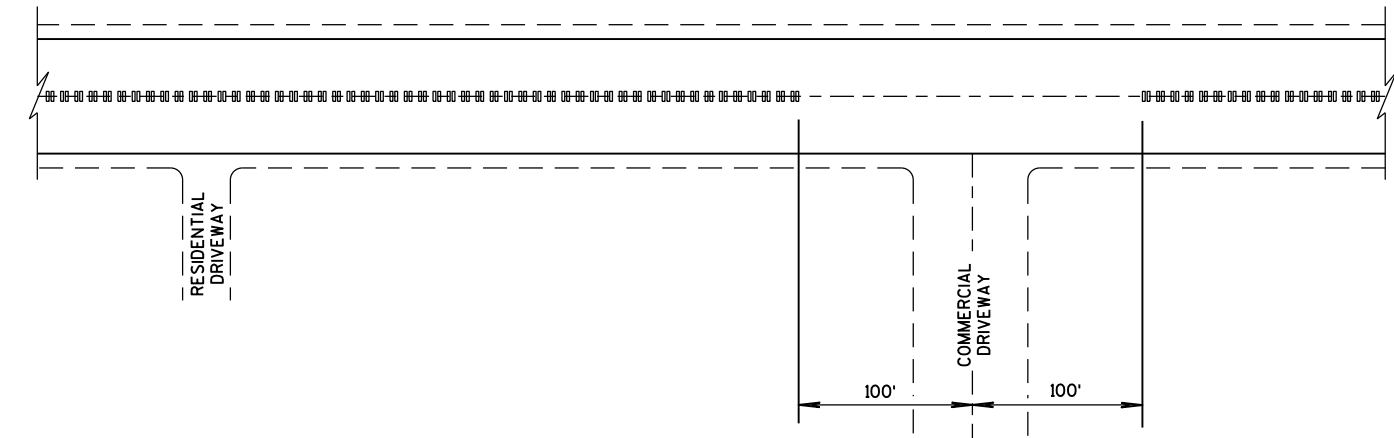
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



CENTER LINE GROOVES AT INTERSECTIONS

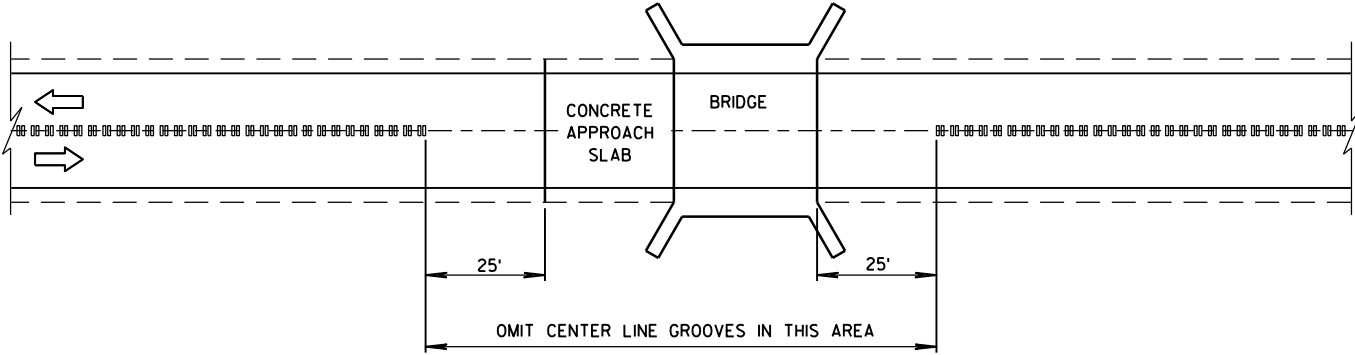


CENTER LINE GROOVES AT INTERSECTIONS
(WITH LEFT TURN LANES)

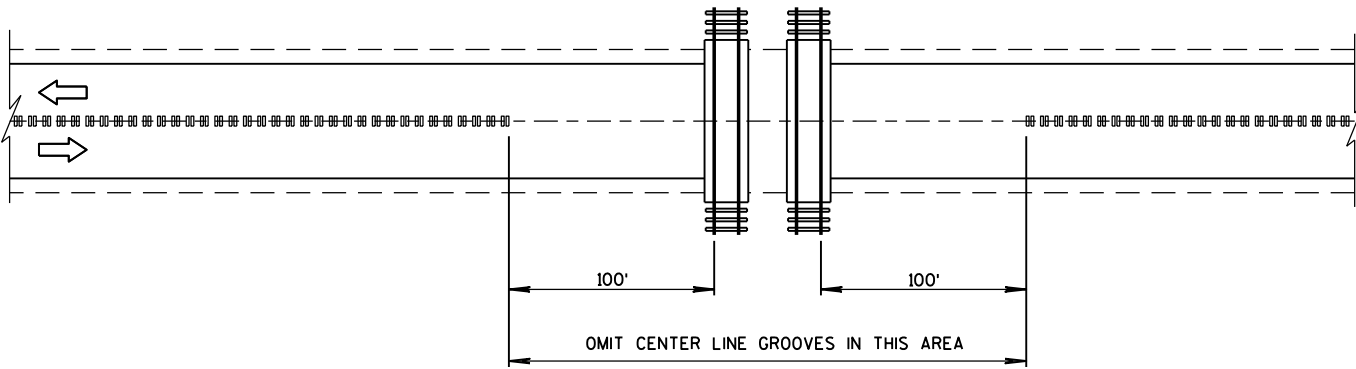


CENTER LINE GROOVES AT DRIVEWAYS^①

① CENTERLINE GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS, WHEN DIRECTED BY THE ENGINEER.



CENTER LINE GROOVES AT BRIDGES



CENTER LINE GROOVES AT RAILROADS

2-LANE RURAL CENTER LINE RUMBLE STRIP, MILLING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 5/15/2013 DATE	/S/ Jerry H. Zogg ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

6

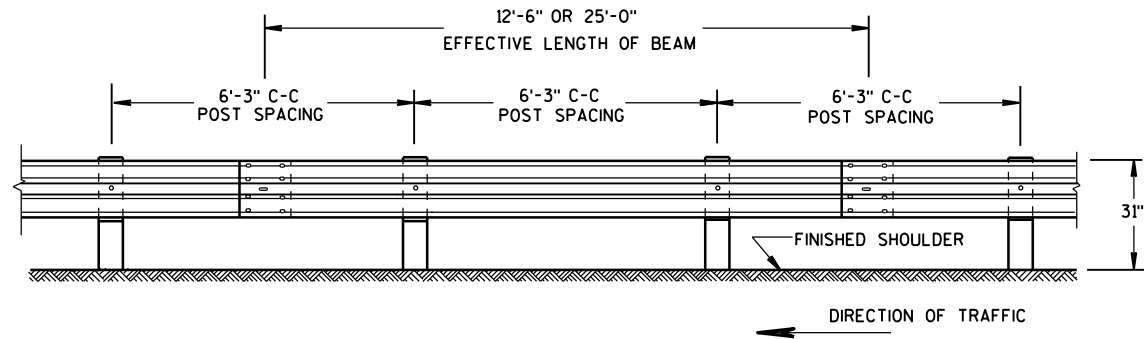
- S.D.D. 14 B 42-3a**



S.D.D. 14 B 42-3a

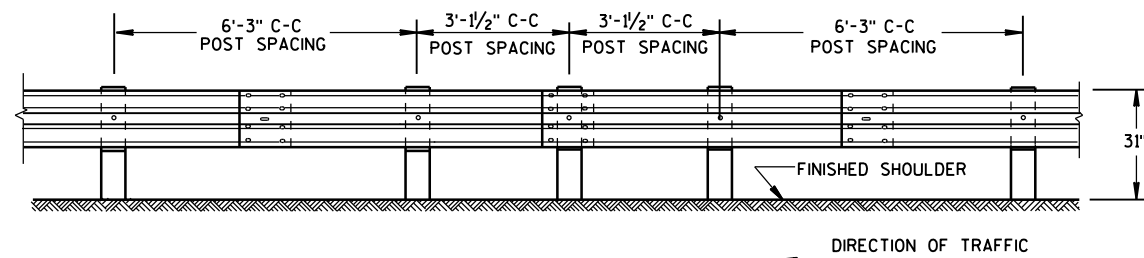


S.D.D. 14 B 42-3a



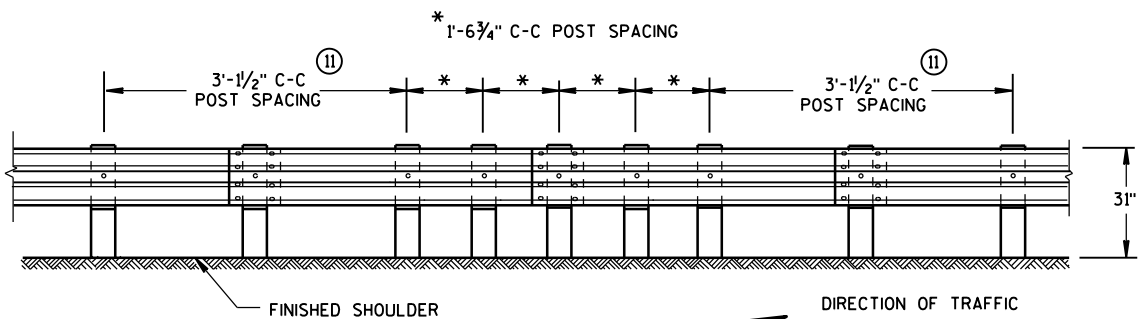
FRONT VIEW

POST SPACING STANDARD INSTALLATION



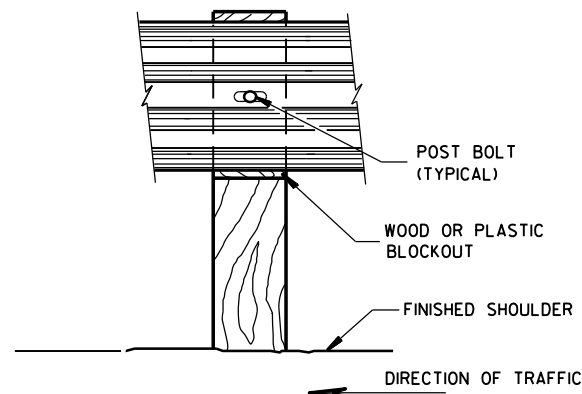
FRONT VIEW

HALF POST SPACING (HS) AND HALF POST SPACING WITH LONGER POSTS (K)

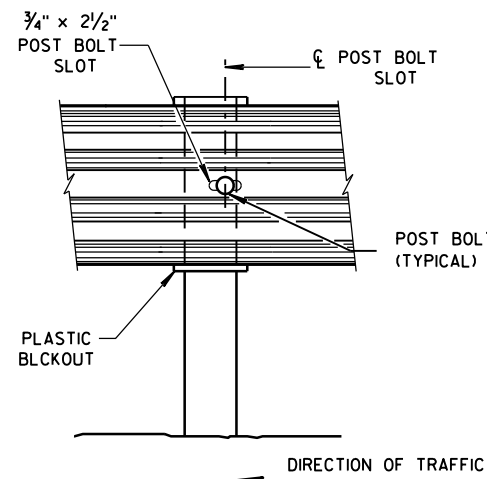


FRONT VIEW

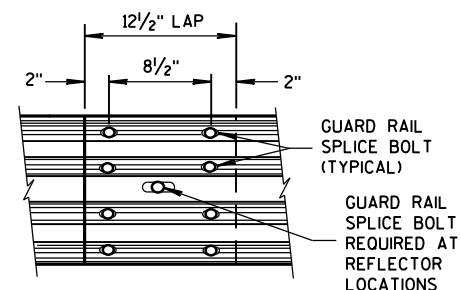
QUARTER POST SPACING (QS)



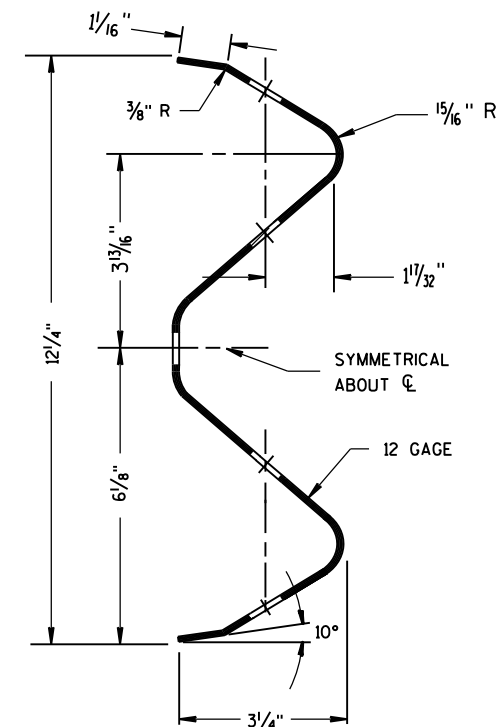
FRONT VIEW AT WOOD POST



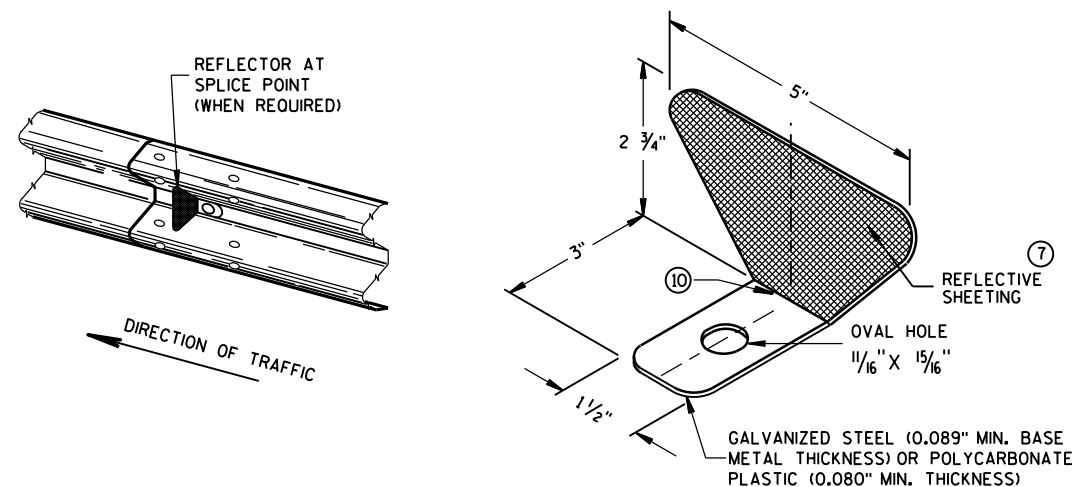
FRONT VIEW AT STEEL POST



FRONT VIEW
MID-SPAN BEAM SPLICE



SECTION THRU W-BEAM RAIL



ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION

GENERAL NOTES

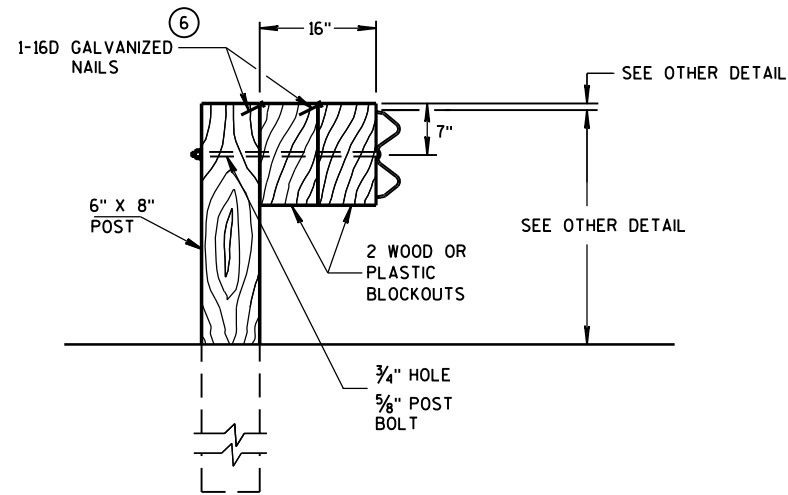
- ⑦ PROVIDE SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH YELLOW REFLECTIVE SHEETING. SHEETING IS TYPE H. SEE STANDARD SPECIFICATION 637.
 - ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
 - ⑨ REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
 - ⑩ PROVIDE AN ANGLE OF BEND OF $90^\circ \pm 1^\circ$ FOR TWO-SIDED REFLECTORS.
 - ⑪ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A $\frac{5}{8}$ " DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES $\frac{5}{8}$ " DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND $\frac{5}{8}$ " DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.
- GUARD RAIL SPLICE BOLTS ARE A $\frac{5}{8}$ " DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES $\frac{5}{8}$ " DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

REFLECTOR SPACING

	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
TWO WAY TRAFFIC	< 200'	25' C-C	1 ⑨	6
	> 200'	50' C-C	1	
TWO WAY TRAFFIC	< 200'	50' C-C	2 ⑩	3
	> 200'	100' C-C	2	

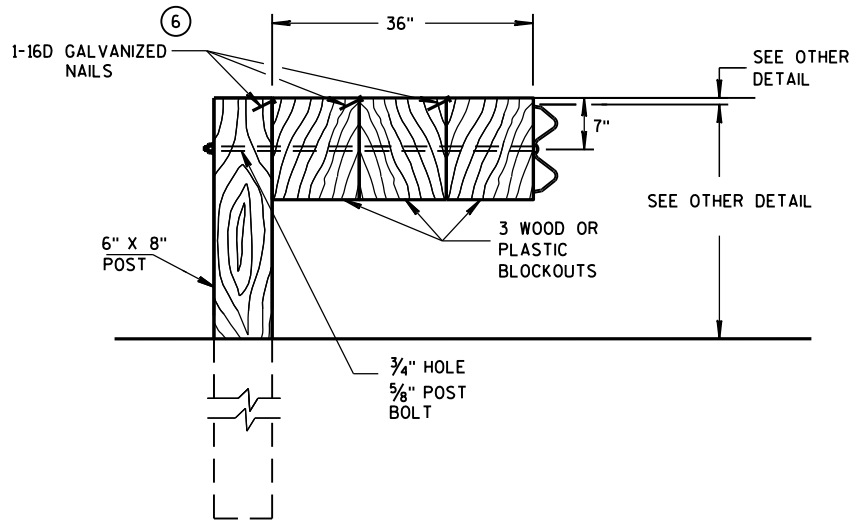
MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



DETAIL FOR 16" BLOCKOUT DEPTH

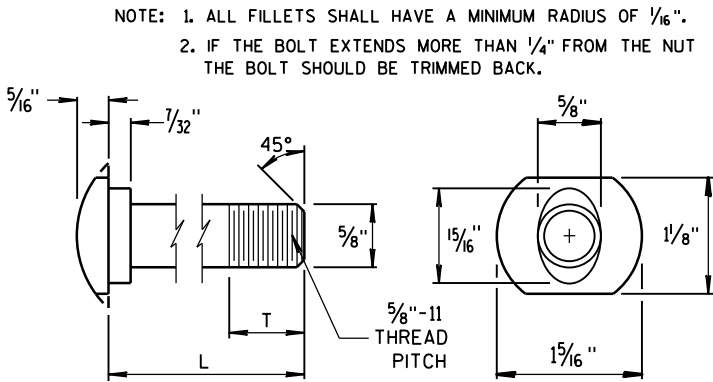
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.



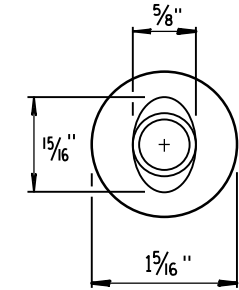
DETAIL FOR 36" BLOCKOUT DEPTH

NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

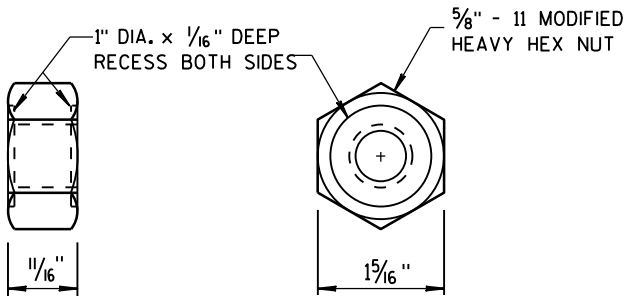
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.



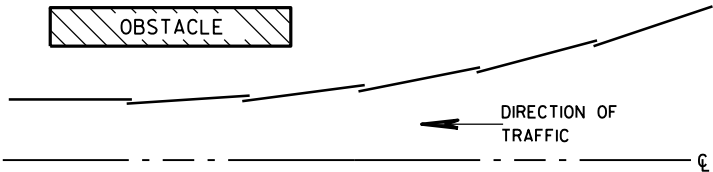
POST BOLT TABLE



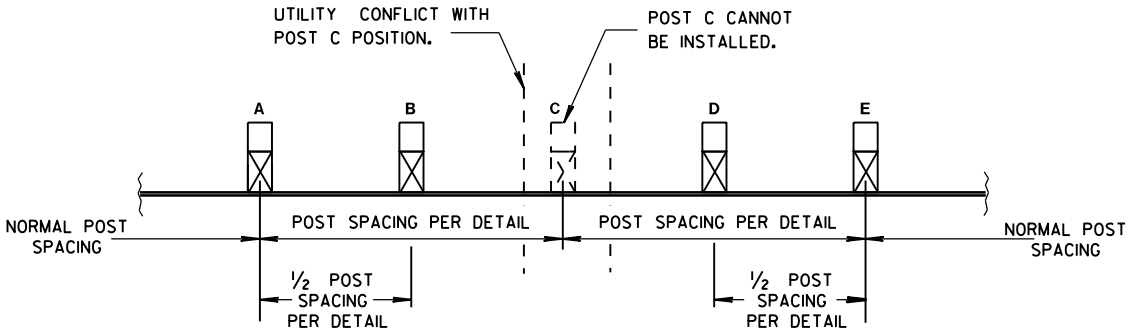
ALTERNATE BOLT HEAD



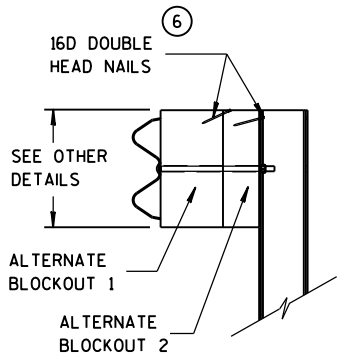
POST BOLT
AND RECESS NUT



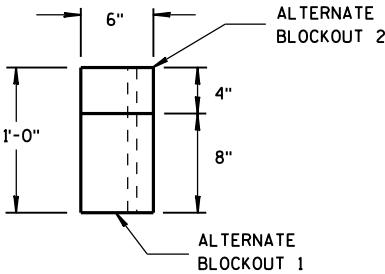
PLAN VIEW
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS
UNDERGROUND OBSTRUCTION



SIDE VIEW



TOP VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2014
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER

GENERAL NOTES

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.
- (C) DIFFERENT MANUFACTURES REQUIRE DIFFERENT PERFORATED W-BEAM RAIL END PANELS. SEE MANUFACTURES INFORMATION.
- (D) THE TOP OF THE STEEL TUBE ON POST 1 AND POST 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.
- (E) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.
- (G) 1/2" DIAMETER X 3" LONG LAG BOLT AND WASHER.
- (H) HARDWARE VARIES BETWEEN DIFFERENT MANUFACTURES. SEE MANUFACTURE'S DRAWING FOR INFORMATION.
- (I) DIMENSIONS MAY VARY. SEE MANUFACTURE'S INFORMATION.

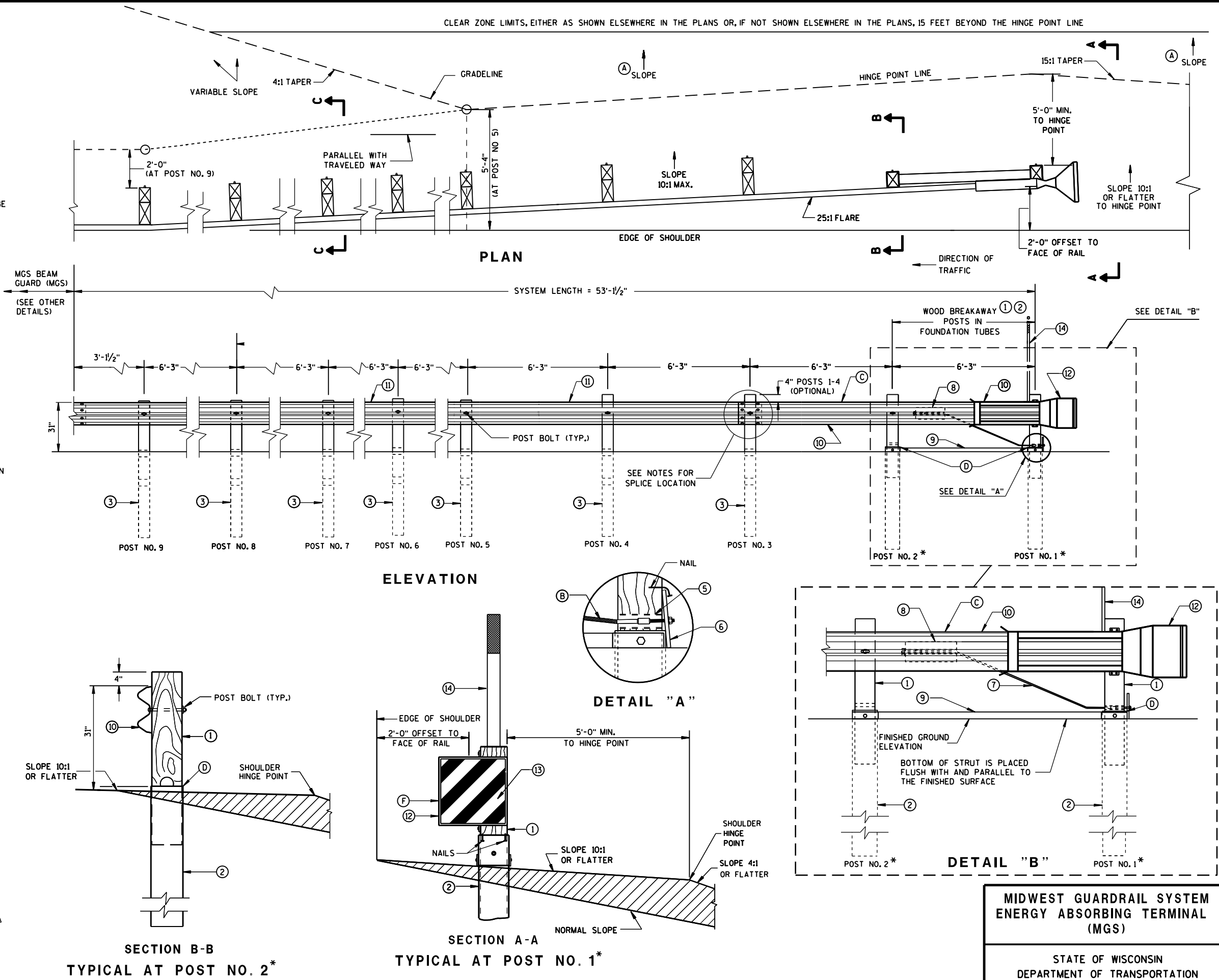
SEE SDD 14B42 FOR MORE INFORMATION.

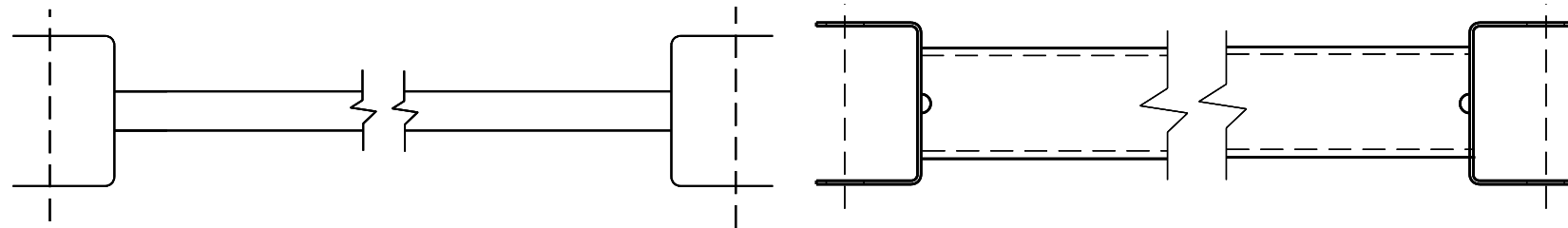
* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

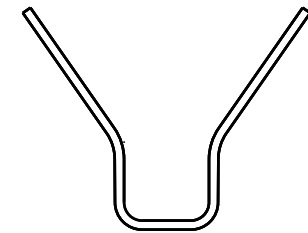
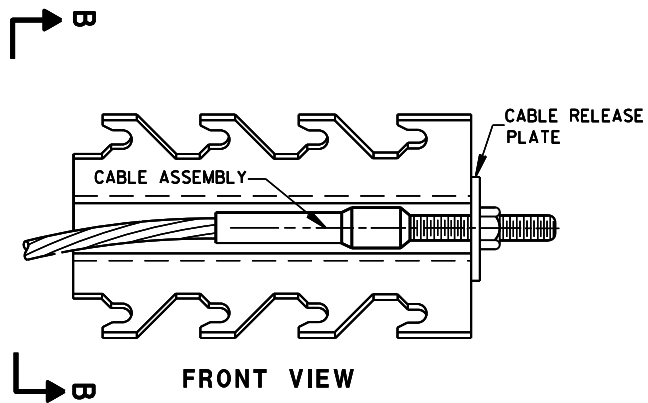
W-BEAM RAIL SPLICES ARE LOCATED AT POST NUMBER 3, AND BETWEEN POST 5 AND 6, BETWEEN POSTS 7 AND 8, AND MIDDLE OF THE SPAN AFTER POST 9.

THE CENTER OF THE UPPER 3/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE.

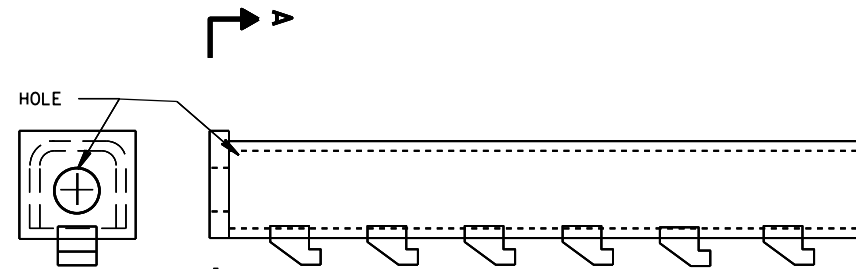




GENERIC GROUND STRUT (9) (H)



SECTION B-B



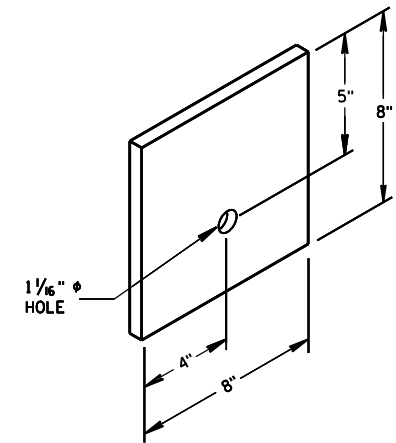
SECTION A-A

PLAN VIEW

GENERIC ANCHOR CABLE BOX (8) (H)

BILL OF MATERIALS

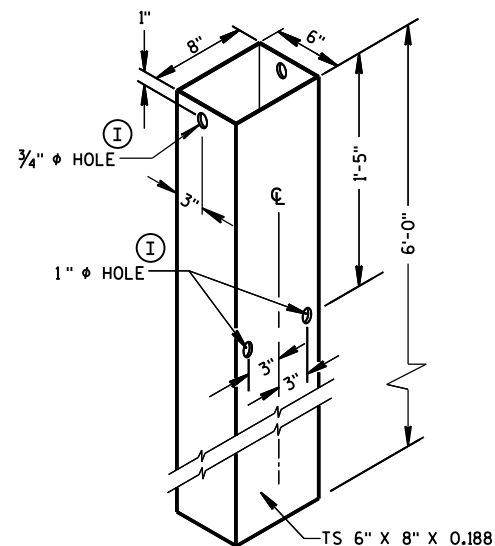
PART NO.	DESCRIPTION
MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.	
(1)	WOOD BREAKAWAY POST
(2)	6" X 8" X 0.188", 6'-0" LONG FOUNDATION TUBE AT POSTS 1 AND 2
(3)	WOOD CRT
(4)	WOOD BLOCKOUT
(5)	PIPE SLEEVE
(6)	BEARING PLATE
(7)	BCT CABLE ASSEMBLY
(8)	ANCHOR CABLE BOX
(9)	GROUND STRUT
(10)	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG.
(11)	STANDARD W-BEAM RAIL. MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
(12)	END SECTION EAT
(13)	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS
(14)	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)



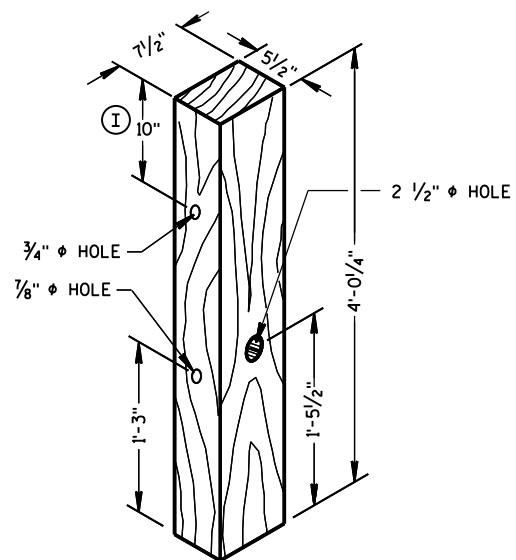
BEARING PLATE (6)

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

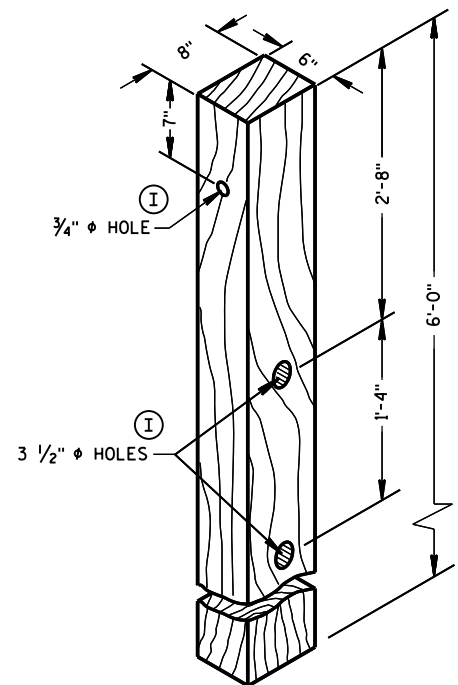
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



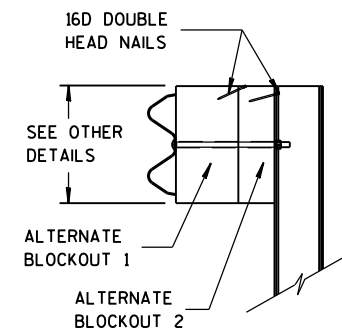
FOUNDATION TUBE ②



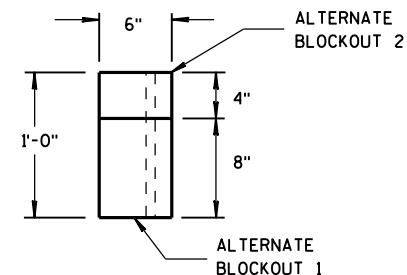
WOOD BREAKAWAY POST ①



WOOD CRT POST ③

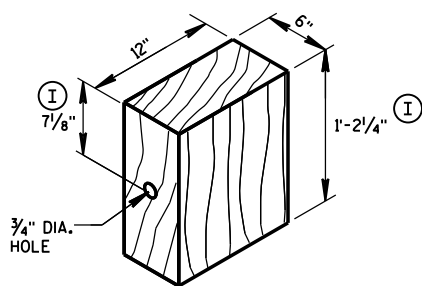


SIDE VIEW



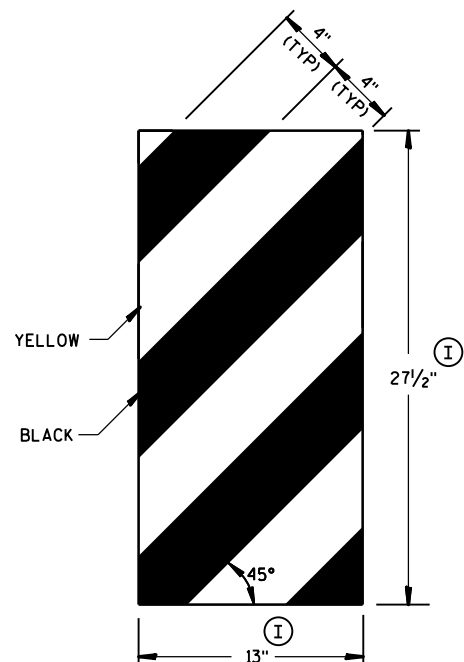
TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

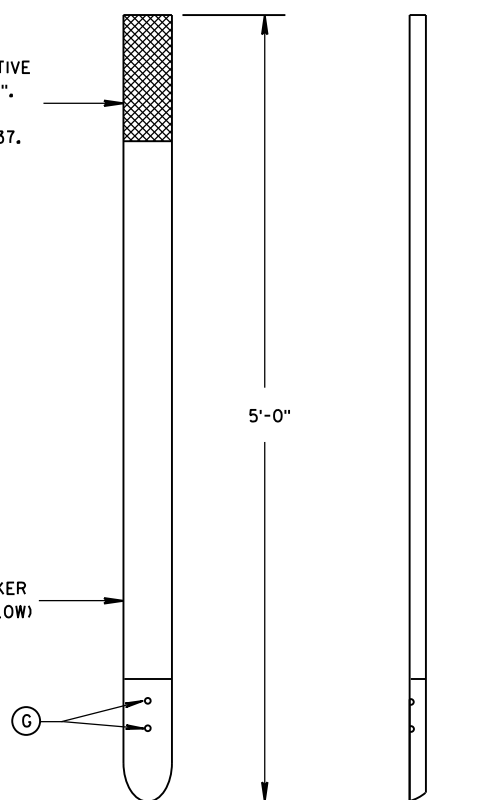
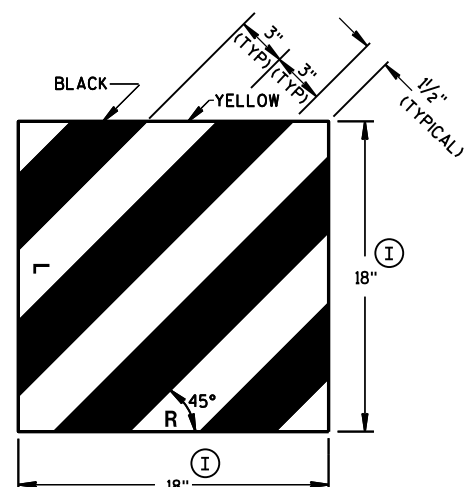


WOOD BLOCKOUT ④
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2

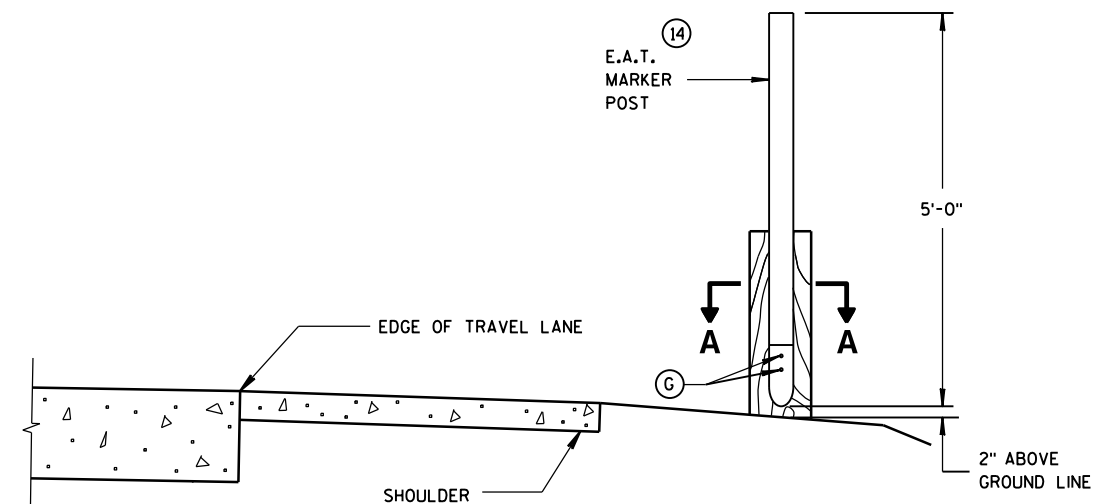
TYPE H
YELLOW REFLECTIVE
SHEETING 3" X 9".
SEE STANDARD
SPECIFICATION 637.



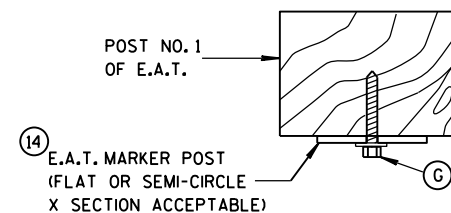
GENERIC REFLECTIVE SHEETING ⑬ ①



E.A.T. MARKER POST ⑭



TYPICAL INSTALLATION OF E.A.T. MARKER POST BACKSIDE OF POST NO. 1
(E.A.T. AND RAIL REMOVED FOR CLARITY)

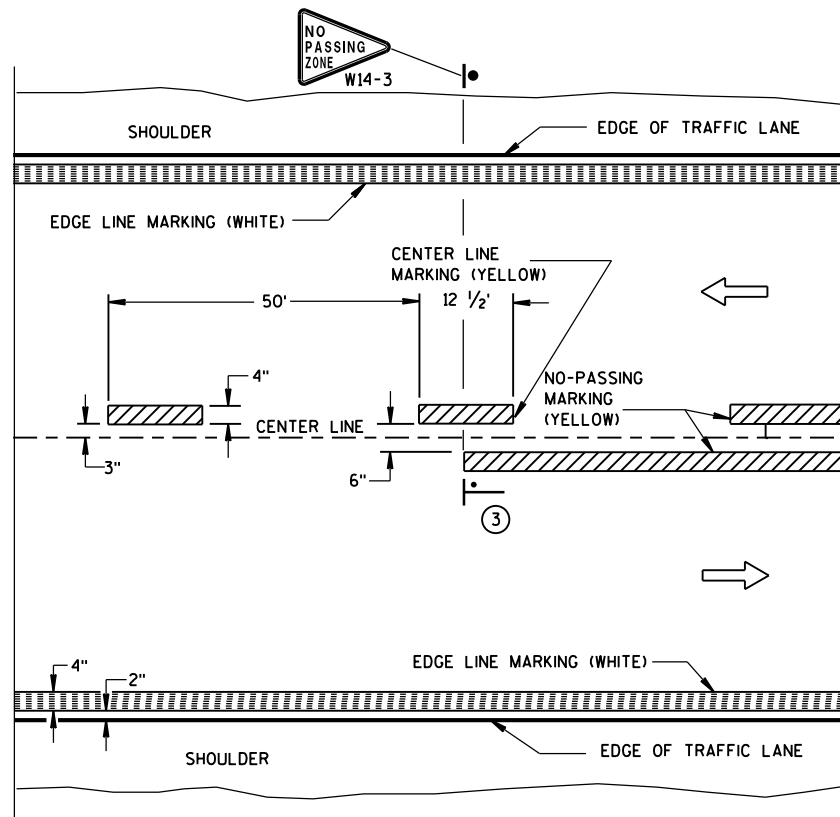


SECTION A-A

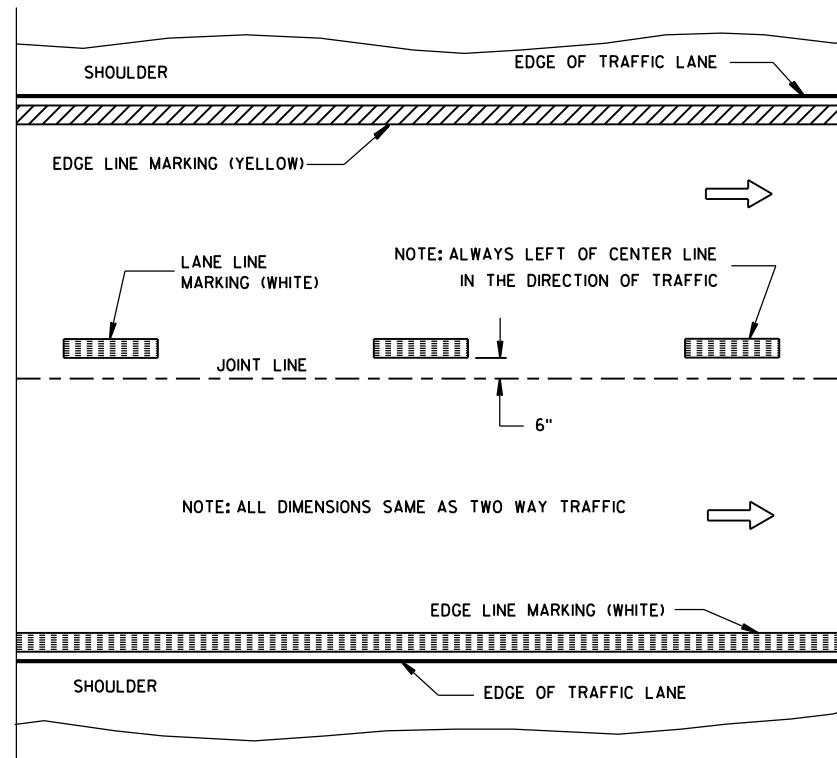
**MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)**

**STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION**

APPROVED
June 2014 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS DEVELOPMENT
ENGINEER
FHWA

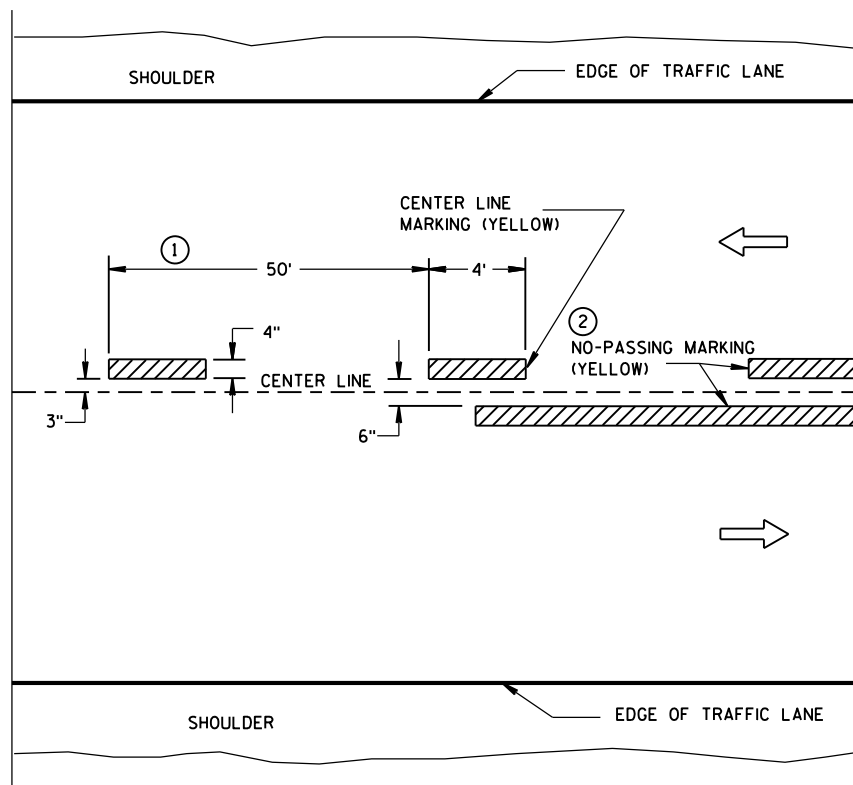


TWO WAY TRAFFIC

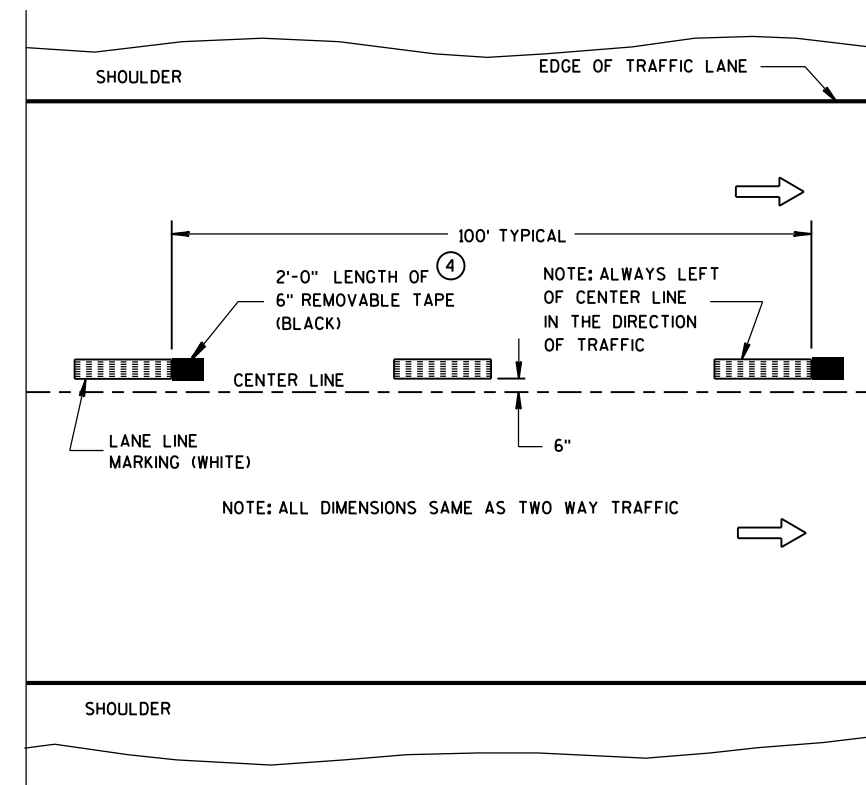


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING
(SHOWS CYCLE FOR TEMPORARY CENTER LINE OR TEMPORARY LANE LINE MARKING)

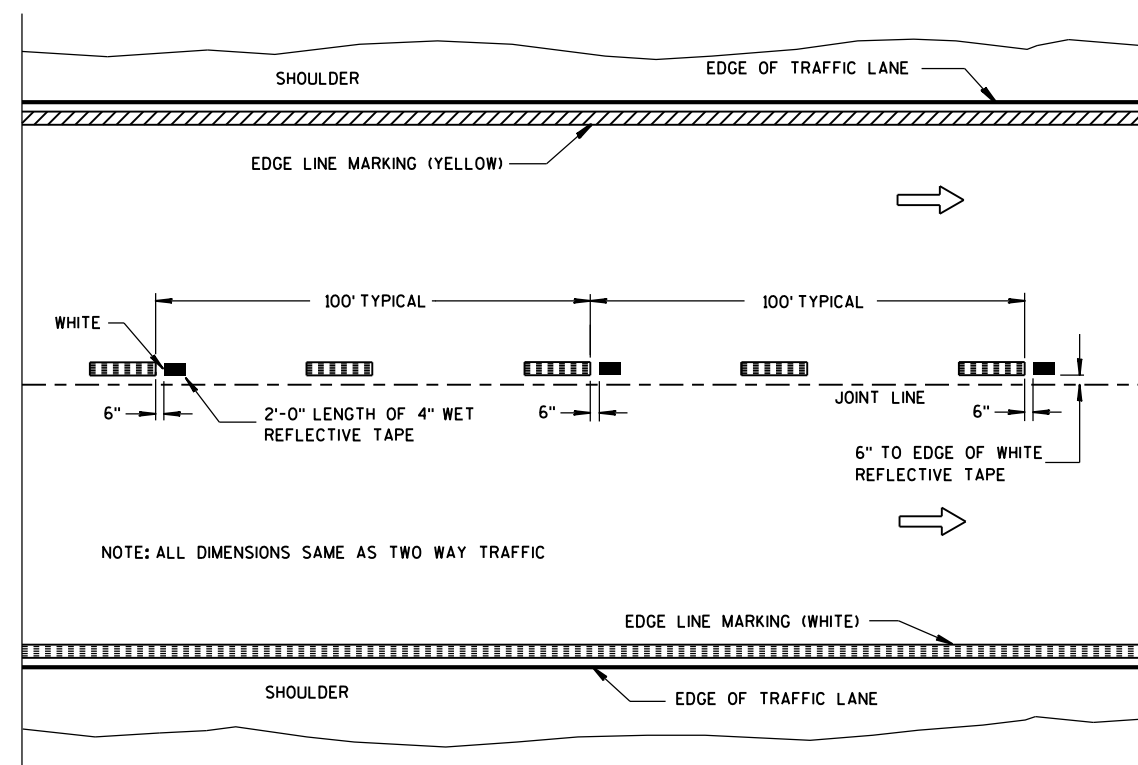
GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

- ① HALF CYCLE LENGTHS (25'±) WITH 2' MINIMUM STRIPE LENGTHS SHALL BE PROVIDED ON ROADWAYS (INCLUDING TEMPORARY TRAVELED WAYS) WITH REVERSE CURVATURE, CURVATURE OF OVER 5 DEGREES OR WHEN DIRECTED BY THE ENGINEER TO MARK UNUSUAL ALIGNMENT OF THE TRAVELED WAY.
- ② NO PASSING ZONE TEMPORARY PAVEMENT MARKING IS REQUIRED TO BE PLACED, WHERE APPROPRIATE, ALONG WITH CENTERLINE TEMPORARY PAVEMENT MARKING WHEN A SAME DAY PERMANENT PAVEMENT MARKING ITEM IS INCLUDED IN THE CONTRACT.
- ③ NO PASSING ZONE MARKINGS ARE PLACED ACCORDING TO "T" MARKINGS. IF EXISTING NO PASSING ZONE W14-3 SIGNS ARE BEYOND 50 FEET IN EITHER DIRECTION, THE SIGNS SHALL BE MOVED TO THE "T" MARKINGS.
- ④ CONCRETE ONLY.

NOTE

ARROW SYMBOL (→) SHOWS DIRECTION OF TRAVEL



WET REFLECTIVE TAPE SUPPLEMENT TO
SPRAYED OR NON WET REFLECTIVE TAPE LANE LINE

LEGEND

- "T" MARKING
- POST MOUNTED SIGN





PAVEMENT MARKING
(MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5-13-2013
DATE
FHWA

/S/ Travis Feltes
STATE TRAFFIC ENGINEER

LEGEND

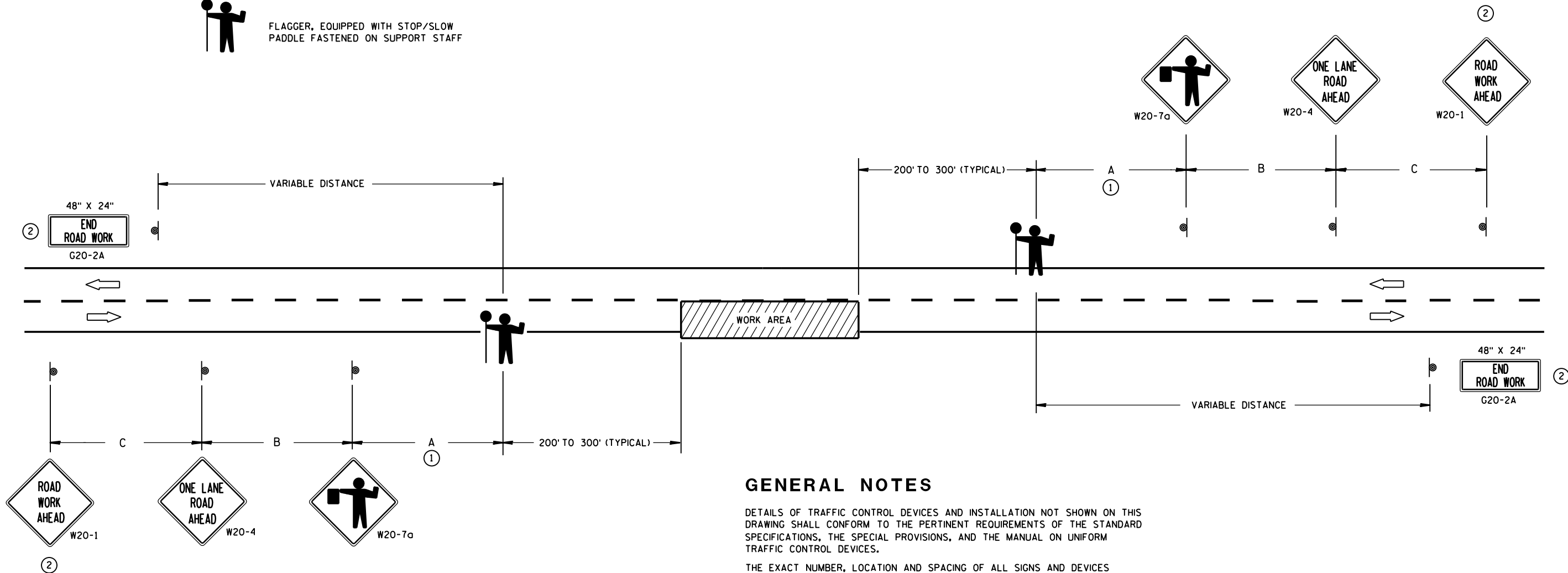
-  SIGN ON PORTABLE OR PERMANENT SUPPORT
-  DIRECTION OF TRAFFIC
-  WORK AREA
-  FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF

SIGN SPACING TABLE

SPEED LIMIT	SIGN SPACING A,B,C
25-35 MPH	200'
35-40 MPH	350'
45-55 MPH	500'



USE OF THE "BE PREPARED TO STOP" SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7a AND W20-4 SIGNS. A 500' TYPICAL SPACING SHALL BE PROVIDED BETWEEN THE SIGNS.



GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS AND DEVICES (AND THE LOCATION OF ALL FLAGGERS) SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT, COVER OR REMOVE ALL TEMPORARY TRAFFIC CONTROL SIGNS.

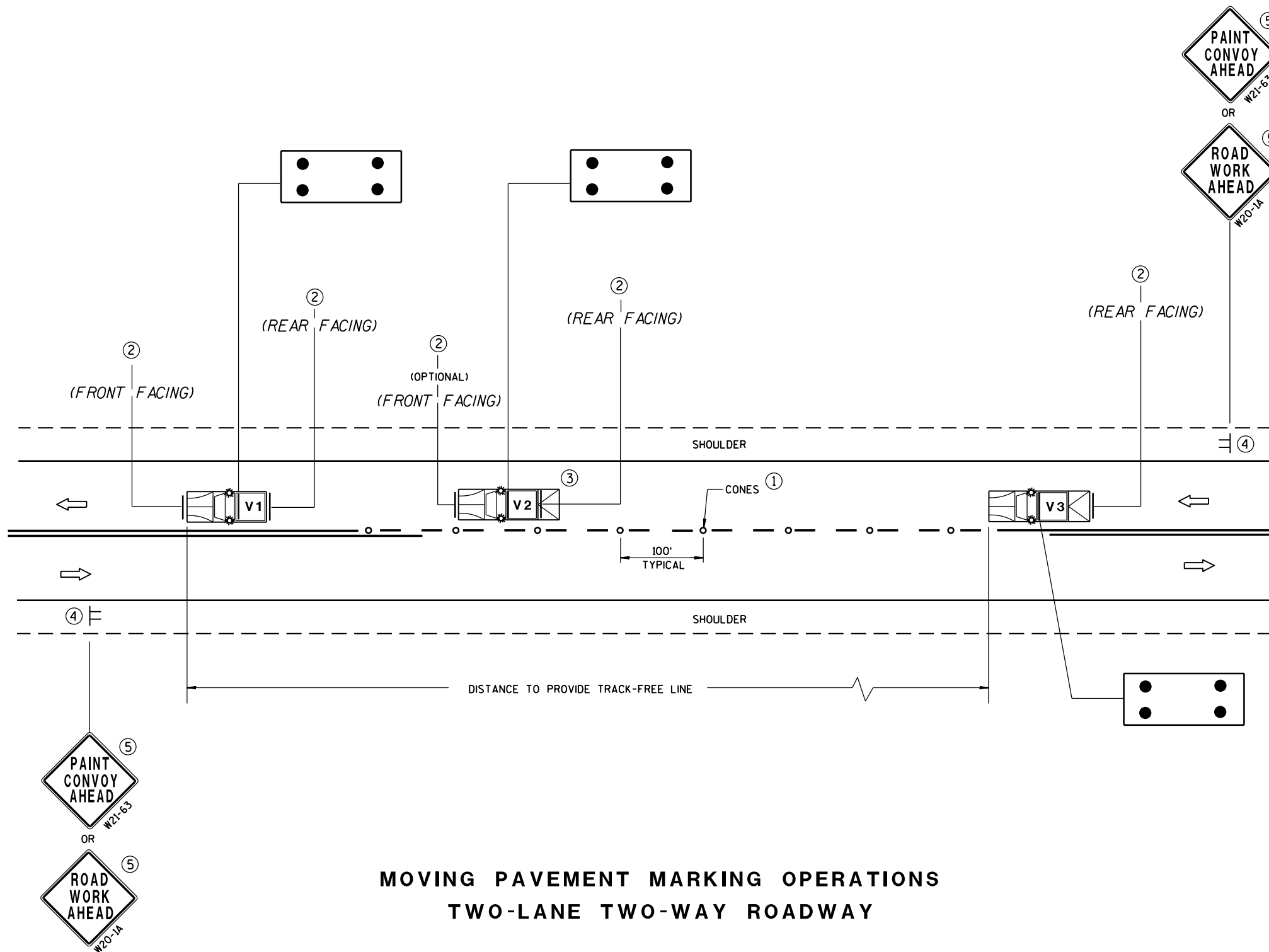
ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

- ① FOR A MOVING WORK OPERATION, SIGNING FOR BOTH DIRECTIONS SHALL BE REESTABLISHED (AS SIMULTANEOUSLY AS PRACTICAL) AT APPROXIMATELY 3500 FOOT INTERVALS IN THE MOVING WORK OPERATION OR AS APPROVED BY THE ENGINEER.
- ② SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.

TRAFFIC CONTROL FOR LANE CLOSURE (SUITABLE FOR MOVING OPERATIONS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/2013 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER OF DESIGN
FHWA



MOVING PAVEMENT MARKING OPERATIONS
TWO-LANE TWO-WAY ROADWAY

GENERAL NOTES

ALL VEHICLES SHALL BE EQUIPPED WITH TWO 360 DEGREE HIGH INTENSITY YELLOW FLASHING LIGHTS OR STROBE LIGHTS AND OPERATED WITH HEADLIGHTS TURNED ON.

VEHICLES SHALL BE EQUIPPED WITH REAR FACING TYPE B OR C FLASHING ARROW PANEL OPERATING IN CAUTION MODE. SIGNS PLACED ON VEHICLES MUST NOT OBSCURE THE ARROW PANEL.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE SPECIFIED.

IF SPEED LIMIT IS 40 MPH OR LESS STATIONARY SIGNS MAY BE OMITTED IF CONES ARE USED.

ALTERNATE SIGN MESSAGES, SUCH AS "PAINT CREW AHEAD" OR "ROAD PAINTING AHEAD" MAY BE USED.

DISTANCE BETWEEN VEHICLES MAY VARY ACCORDING TO TERRAIN, SIGHT DISTANCE, PAINT DRYING TIME, AND OTHER FACTORS. WHENEVER ADEQUATE STOPPING SIGHT DISTANCE EXISTS TO THE REAR, SHADOW VEHICLES SHOULD MAINTAIN THE MINIMUM DISTANCE FROM THE WORK VEHICLE AND PROCEED AT THE SAME SPEED AS THE WORK VEHICLE. SHADOW VEHICLES SHOULD SLOW DOWN IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.

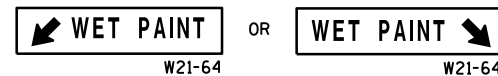
THE WORK AND SHADOW VEHICLES SHOULD PULL OVER PERIODICALLY TO ALLOW TRAFFIC TO PASS.

THIS DRAWING SHALL BE USED FOR CENTERLINE OR EDGELINE MARKING.

WHEN NO WORK ACTIVITY IS TAKING PLACE, REMOVE OR TURN THE STATIONARY WARNING SIGNS AWAY FROM TRAFFIC.

① CONES MAY BE OMITTED ON PAINTED LINE IF APPROVED BY THE ENGINEER. CONSIDER PAVEMENT MARKING DRY OR CURE TIMES AND TRAFFIC VOLUME.

② USE STANDARD SIGN W21-64 WITH APPROPRIATE ARROW.



③ OPTIONAL TRUCK-MOUNTED ATTENUATOR.

④ SIGNS SHALL BE REPEATED APPROXIMATELY EVERY THREE MILES.

⑤ IF CONSTRUCTION WORK ZONE SIGNS ARE IN PLACE, W20-1 OR W21-63 ARE NOT REQUIRED.

LEGEND

V1 LEAD VEHICLE

V2 SHADOW VEHICLE

V3 TRAIL VEHICLE WITH TMA

TMA TRUCK-MOUNTED ATTENUATOR

SIGN ON TEMPORARY SUPPORT

DIRECTION OF TRAFFIC

CONES

FLASHING ARROW PANEL (CAUTION)

MOVING PAVEMENT MARKING
OPERATION
TWO-LANE TWO-WAY ROADWAY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

DATE /S/ Peter Amakobe Atepe
STATEWIDE WORK ZONE TRAFFIC
SAFETY ENGINEER

FHWA

GENERAL NOTES

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY DISTRICT TRAFFIC UNIT.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

W20-1A AND G20-2A SIGNS ARE NOT REQUIRED IF THE WORK AREA IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT. G20-2A SIGNS MAY ALSO BE OMITTED IF DURATION OF WORK IS LESS THAN 7 CONTINUOUS DAYS AND NIGHTS.

CHANNELIZING DEVICES PLACED ADJACENT TO THE WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

TABLE A

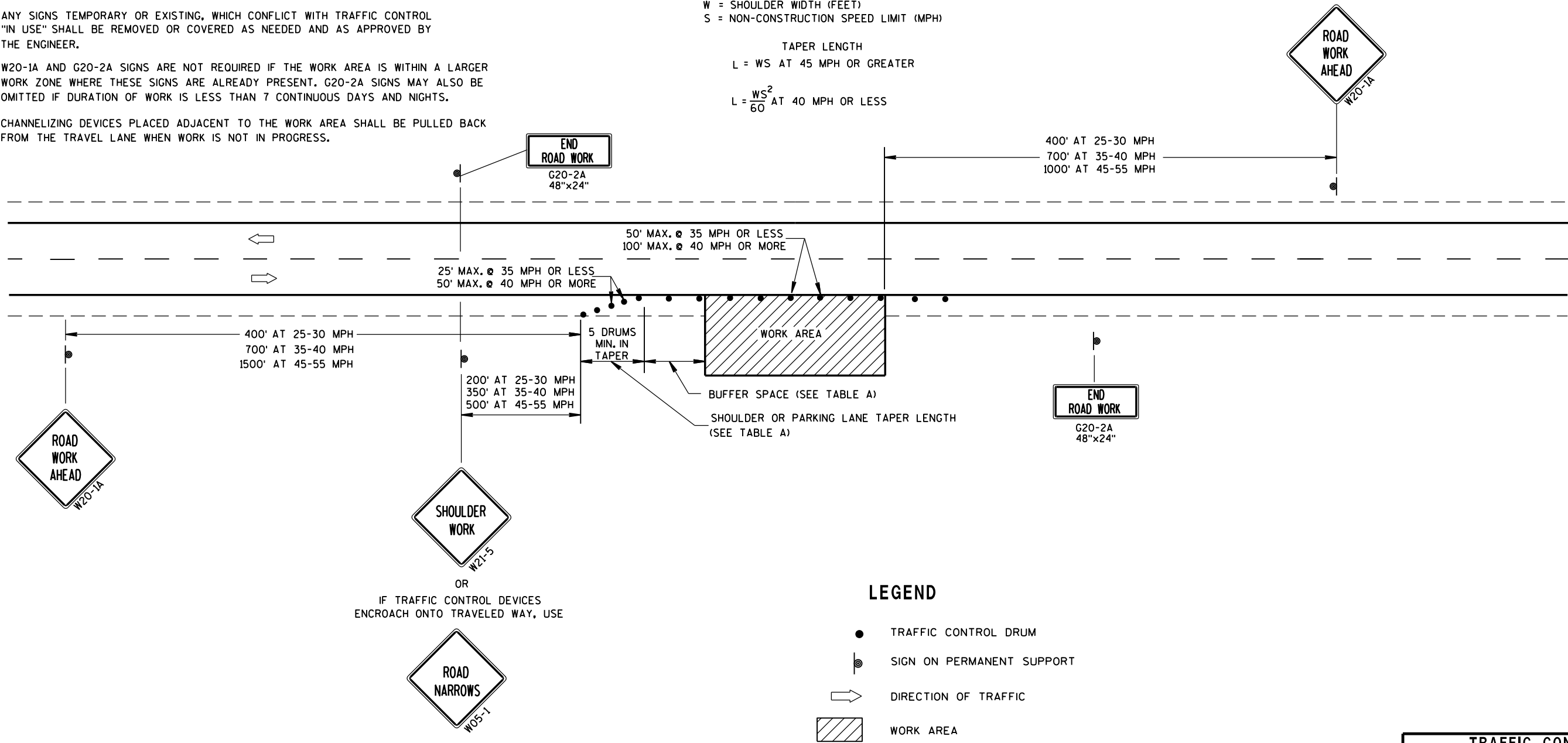
SHOULDER TAPER LENGTH (FEET)					BUFFER SPACE (FEET)
S \ W	4	6	8	10	
30	20	30	40	50	200
35	30	45	55	70	250
40	40	55	75	90	305
45	60	90	120	150	360
50	70	100	135	170	425
55	75	110	150	185	495

W = SHOULDER WIDTH (FEET)
S = NON-CONSTRUCTION SPEED LIMIT (MPH)

TAPER LENGTH
L = WS AT 45 MPH OR GREATER

$L = \frac{WS^2}{60}$ AT 40 MPH OR LESS

SHOULDER TAPER LENGTH = $\frac{1}{3}L$

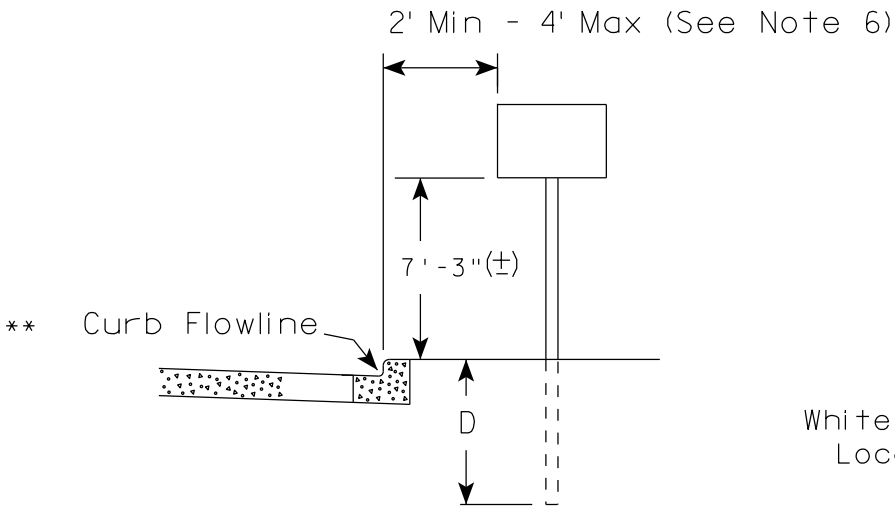


LEGEND

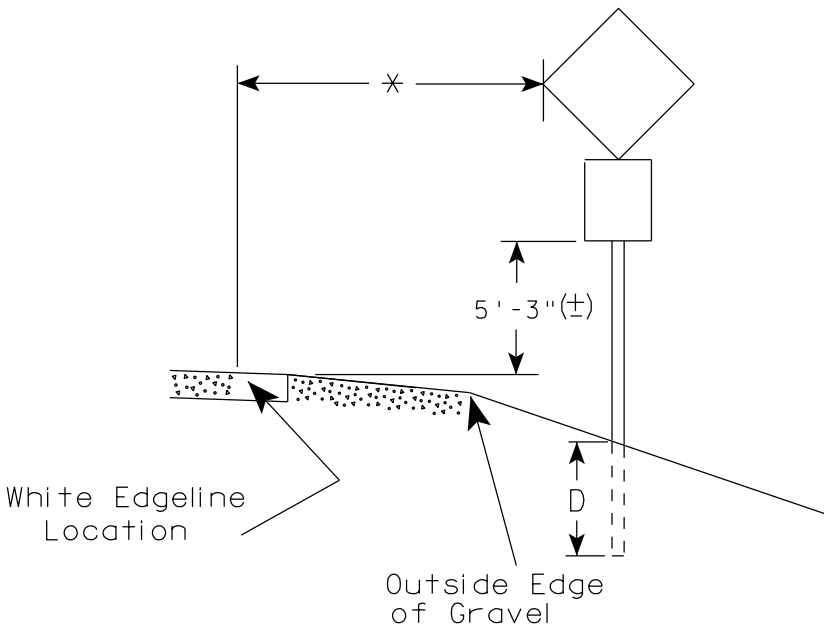
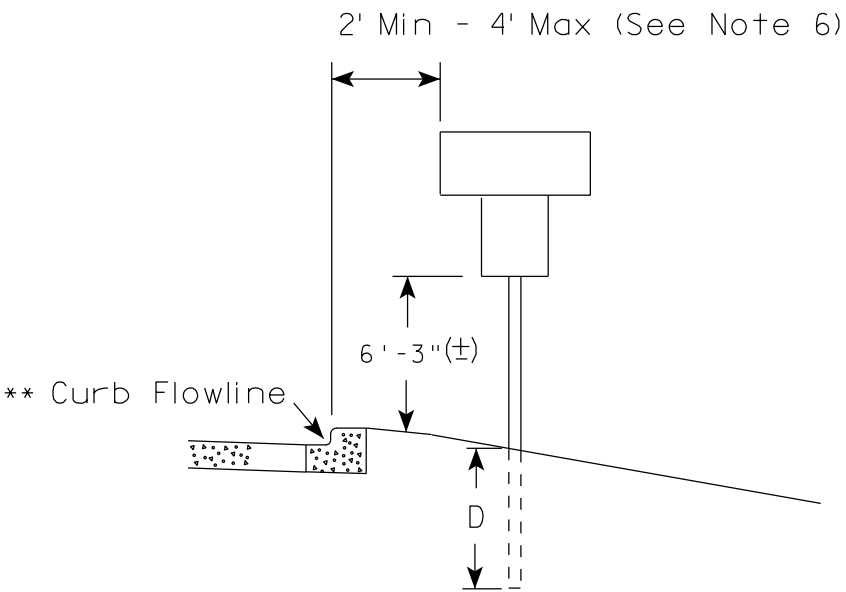
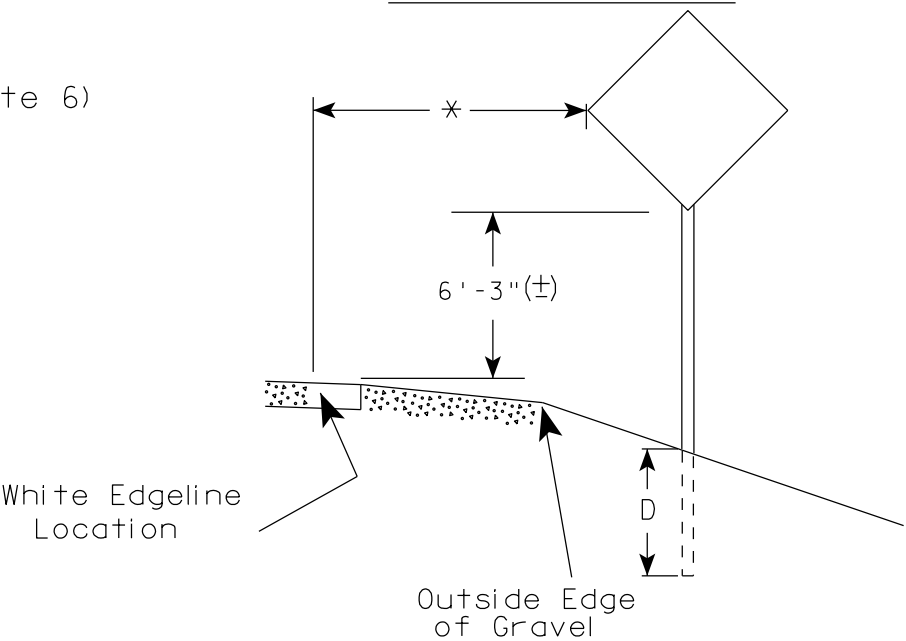
- TRAFFIC CONTROL DRUM
- ⦿ SIGN ON PERMANENT SUPPORT
- ➡ DIRECTION OF TRAFFIC
- ▨ WORK AREA

TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED July 14, 2015 DATE	/S/ Peter Amakobe Atepe STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER
FHWA	

URBAN AREA



RURAL AREA (See Note 2)



GENERAL NOTES

1. Signs wider than 4 feet or 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on barrier wall, see A4-10 sign plate.
3. For expressways and freeways, mounting height is 7'-3" (±) or 6'-3" (±) depending upon existence of a sub-sign.
4. Minimum mounting height for J assemblies (A2-1S) is 7'-3" (±) or 6'-3" (±) per urban or rural detail respectively.
5. Minimum mounting height for signs mounted on traffic signal poles is 5'-3" (±).
6. Offset distance shall be consistent with existing signs or consistent throughout length of project.
7. The (±) tolerance for mounting height is 3 inches.
8. Folding signs shall be mounted at a height of 5'-3" (±) or as directed by the Engineer.
9. The Double Arrow sign (W12-1) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Enhanced Reference Markers, Clearance Markers (W5-52), Mile Markers (D10 series), In Road Object Markers (W5-54) & End of Road Markers (W5-56) shall be mounted at a height of 4'-3" (±).

POST EMBEDMENT DEPTH

Area of Sign Installation (Sq.Ft.)	D (Min)
20 or Less	4'
Greater than 20	5'

×× The existence of curb and gutter does not in itself mandate the vertical clearance illustrated. That height is typically measured where there is sidewalk adjacent to the roadway or parking is permitted. In the absence of sidewalk vertical clearance is measured from the top of the curb. Offset of signs is measured from the flow line.

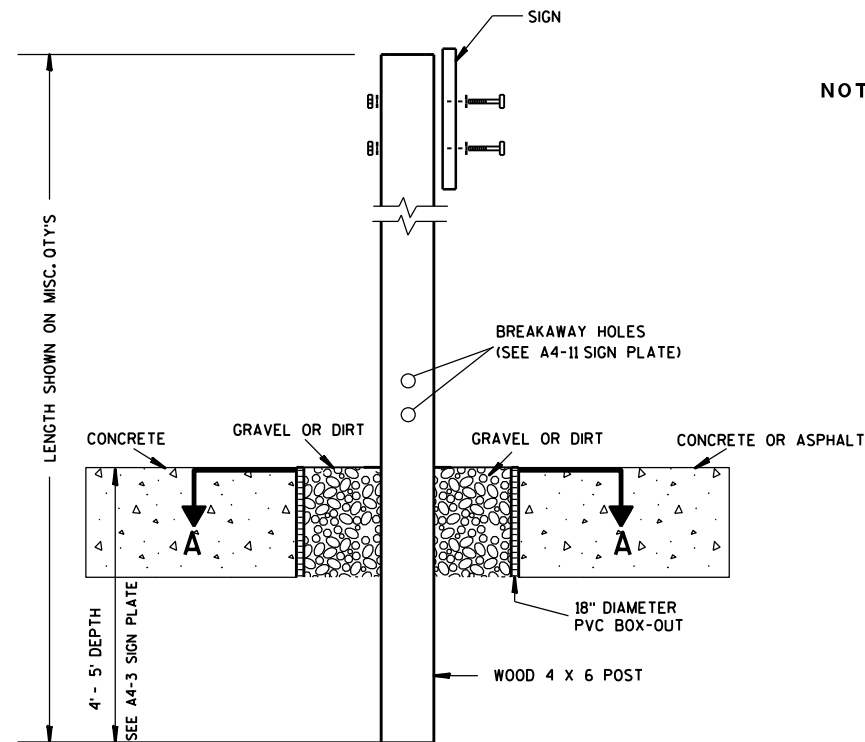
* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

TYPICAL INSTALLATION
OF PERMANENT TYPE II
SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

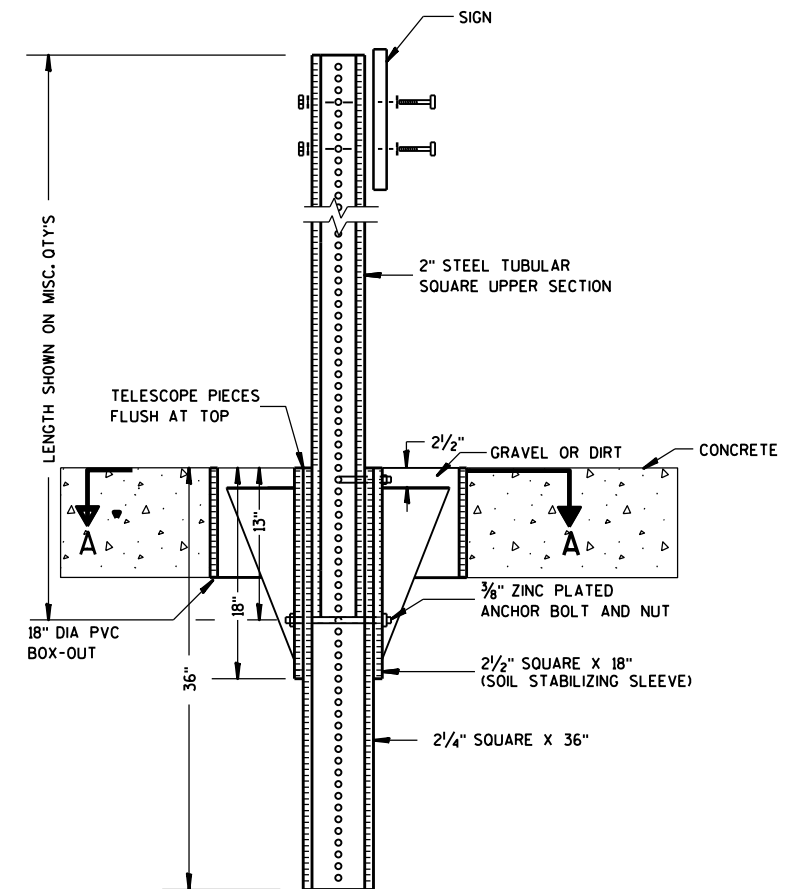
DATE 7/23/15 PLATE NO. A4-3.20



ELEVATION VIEW

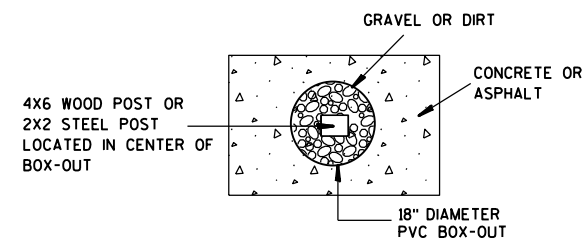
DETAIL OF WOOD 4 X 6 SIGN POST IN BOX-OUT

- NOTES: 1. ALL MATERIAL TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION
2. SEE SIGN PLATE A4-8 FOR SIGN HARDWARE REQUIREMENTS
3. 18 INCH X 18 INCH SQUARE BOX-OUTS MAY BE USED FOR INSTALLATIONS IN EXISTING CONCRETE OR ASPHALT LOCATIONS.



ELEVATION VIEW

DETAIL OF STEEL 2 X 2 SIGN POST IN BOX-OUT



PLAN VIEW

FOR NEW CONCRETE/ASPHALT INSTALLATIONS

SIGN POST
BOX-OUTS
A4-3B

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 1/27/14 PLATE NO. A4-3B.1

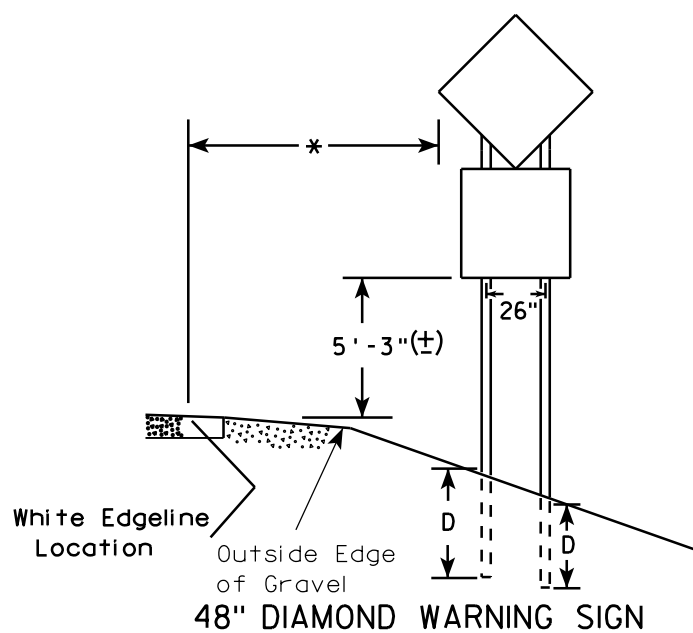
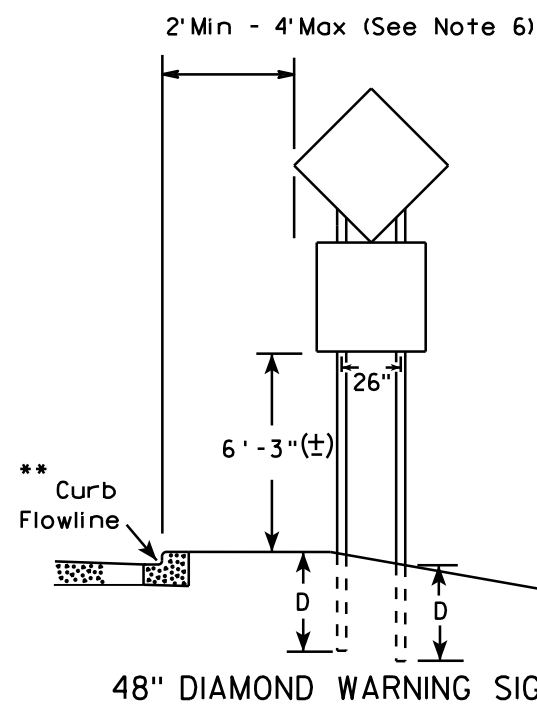
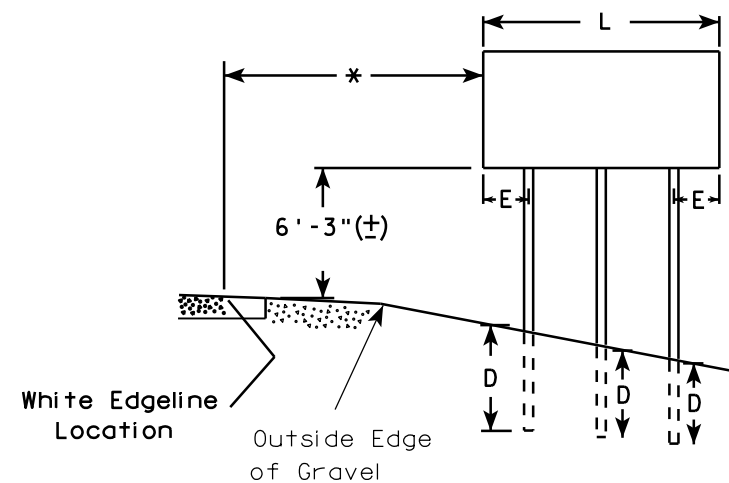
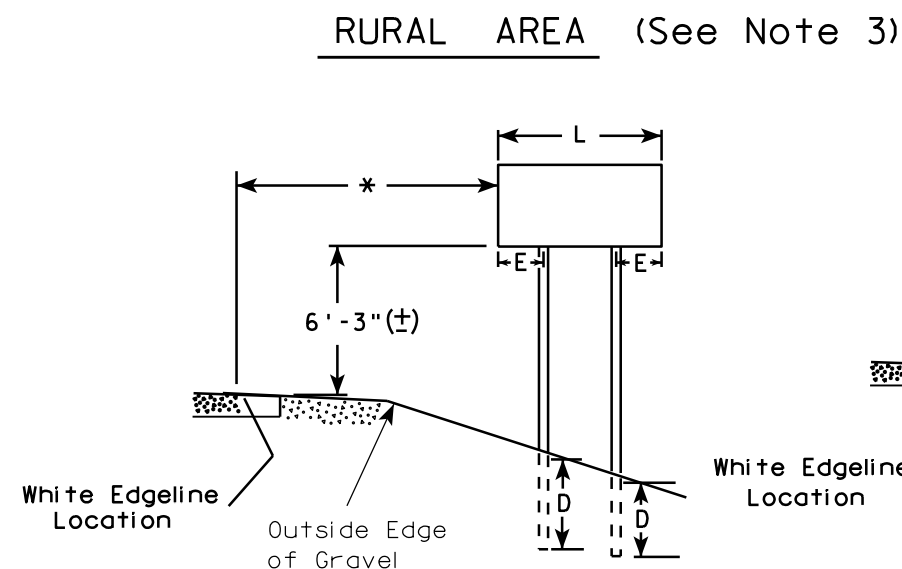
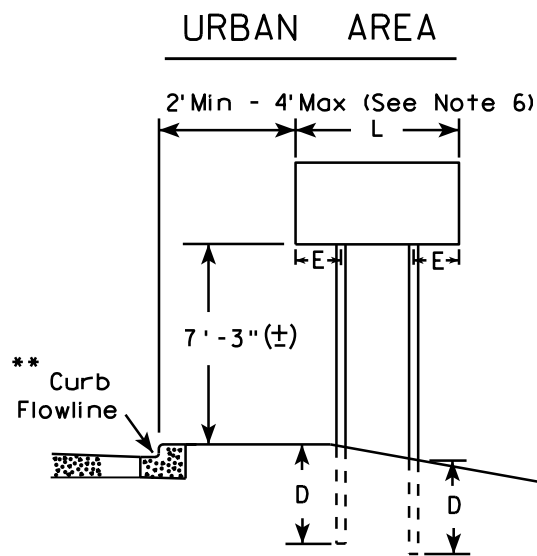
PROJECT NO:

HWY:

COUNTY:

SHEET NO:

E



- GENERAL NOTES**
1. For 3 or 4 post installations, individual post spacing shall be greater than 3'-6".
 2. See tables below for required number of posts.
 3. For expressways and freeways, mounting height is 7'-3" (±) or 6'-3" (±) depending upon existence of sub-sign.
 4. The (±) tolerance for mounting height is 3 inches.
 5. Minimum mounting height for J assemblies (A2-1S) is 7'-3" (±) or 6'-3" (±) per urban or rural detail respectively.
 6. Offset distance shall be consistent with existing signs or consistent throughout length of project.
 7. Folding signs shall be mounted at a height of 5'-3" (±) or as directed by the engineer.
 8. The Double Arrow sign (W12-1) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Clearance Markers (W5-52), Mile Markers (D10 series), In Road Object Markers (W5-54) & End of Road Markers (W5-56) shall be mounted at a height of 4'-3" (±).

* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

** The existence of curb and gutter does not in itself mandate the vertical clearance illustrated. That height is typically measured where there is sidewalk adjacent to the roadway or parking is permitted. In the absence of sidewalk vertical clearance is measured from the top of the curb. Offset of signs is measured from the flow line.

*** See A4-3 sign plate for signs 4' or less in width and less than 20 S.F. in area.

SIGN SHAPE OTHER THAN DIAMOND (TWO POSTS REQUIRED)	
L	E
Greater than 48" Less than 60"	12"
60" to 120"	L/5

SIGN SHAPE OTHER THAN DIAMOND (THREE POSTS REQUIRED)	
L	E
Greater than 120" less than 168"	12"

SIGN SHAPE OTHER THAN DIAMOND (FOUR POSTS REQUIRED)	
L	E
168" and greater	12"

POST EMBEDMENT DEPTH

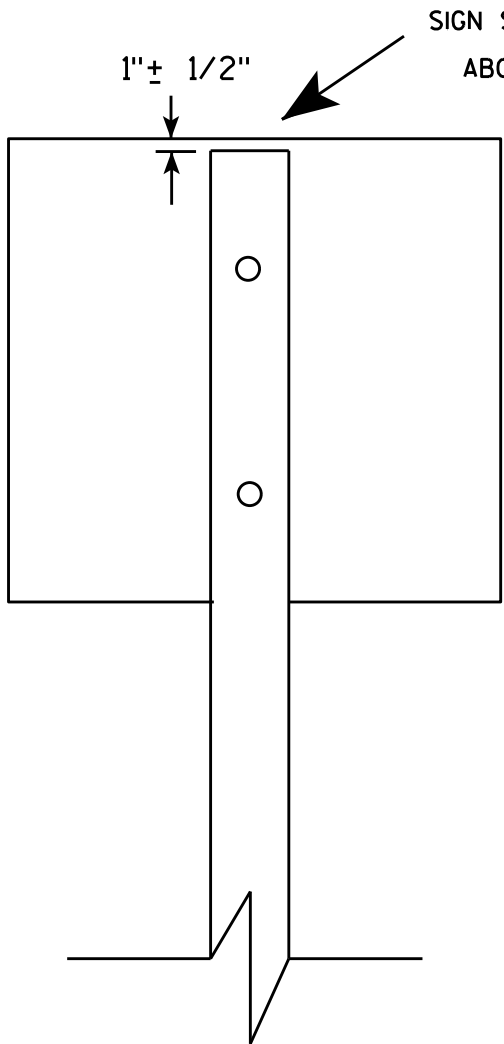
Area of Sign Installation (Sq. Ft.)	D (Min)
20 or Less	4'
Greater than 20	5'

TYPICAL INSTALLATION
OF TYPE II SIGNS
ON MULTIPLE POSTS

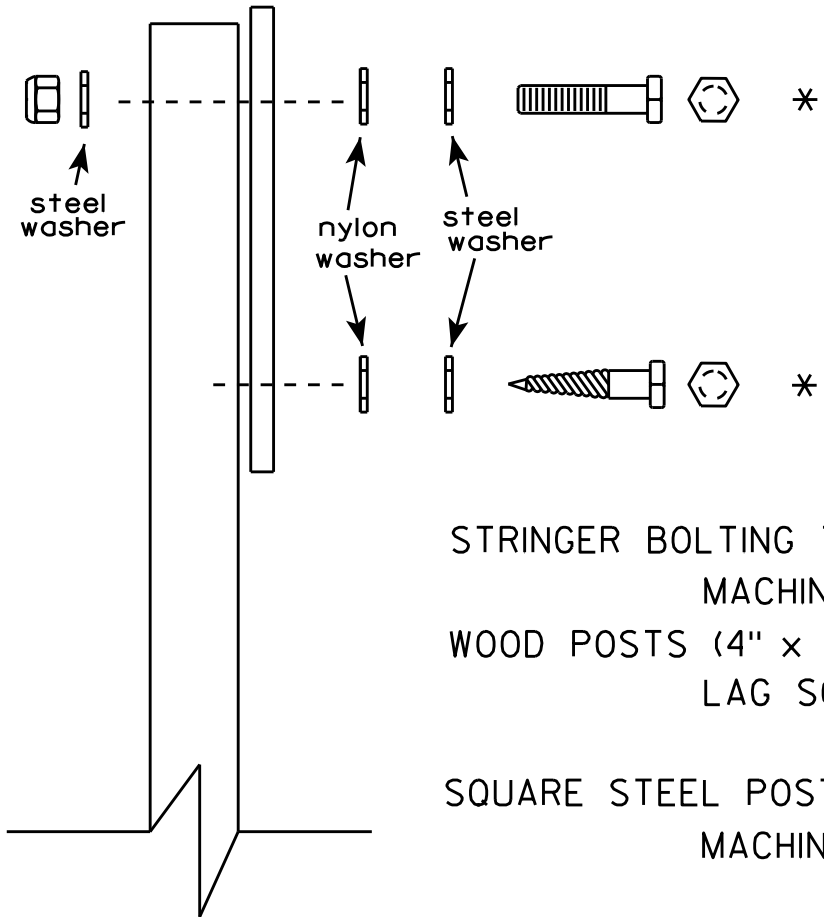
WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 7/23/15 PLATE NO. A4-4.14



SIGN SHALL BE MOUNTED TO PROJECT
ABOVE THE TOP OF THE POST



Nuts, bolts and lags used for mounting signs shall have hexagonal heads and shall be either :

- a. Hot dip galvanized in accordance with ASTM Designation: A 153, Class D, or SC 3
- b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3.

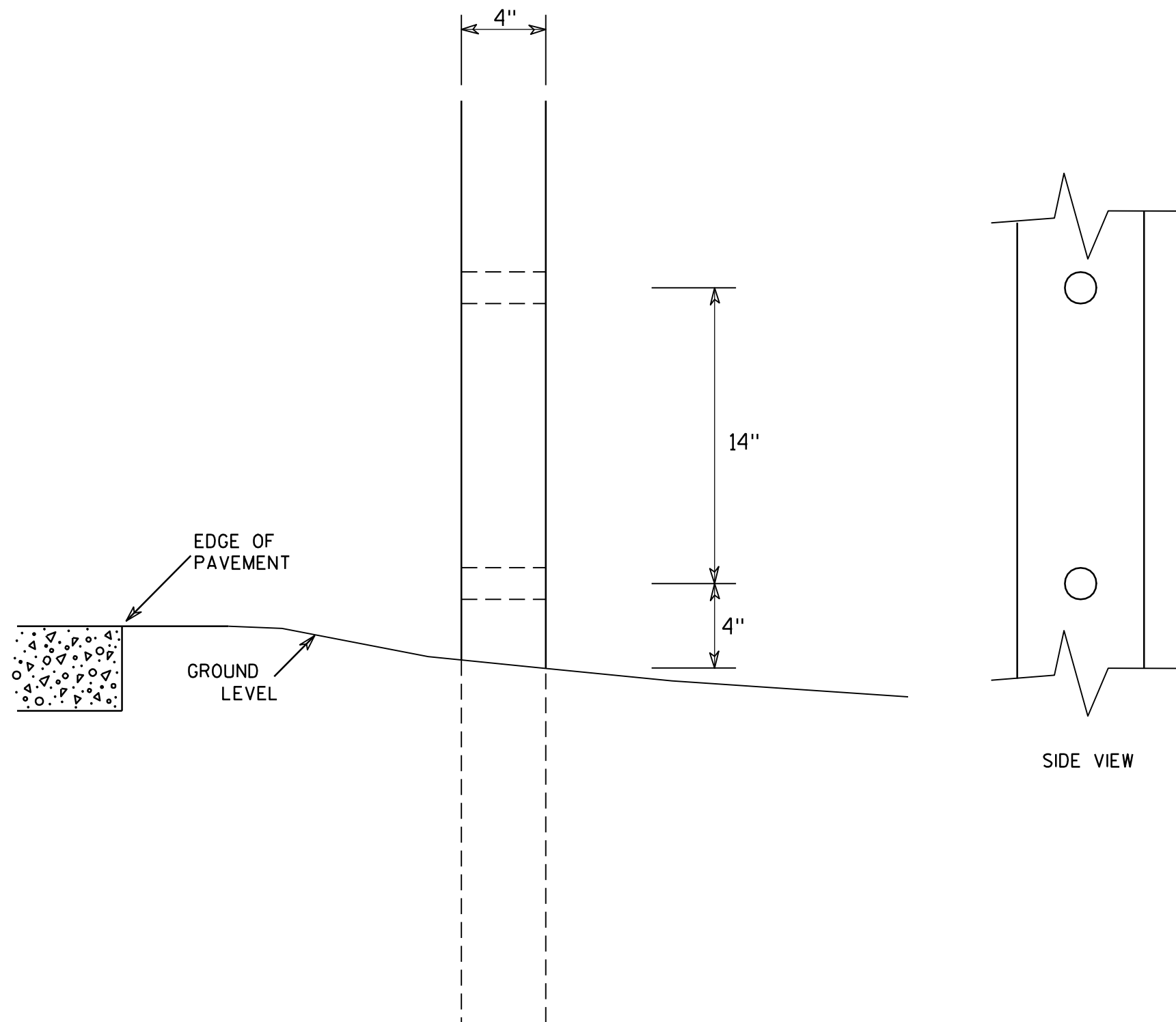
Threads on bolts and nuts shall be manufactured with sufficient allowance for the cadmium plate or galvanized coating to permit the nuts to run freely on the bolts.

- STRINGER BOLTING TO ALUMINUM SIGNS (SEE SIGN PLATE A4-18)
- MACHINE BOLTS - 5/16" X 1-3/4" Length w/ nuts
- WOOD POSTS (4" x 4" or 4" x 6")
- LAG SCREWS - 3/8" X 3" (NO STRINGERS ON BACK OF SIGN)
 - 3/8" X 4" (STRINGERS ON BACK OF SIGN)
- SQUARE STEEL POSTS (2" x 2")
- MACHINE BOLTS - 3/8" X 3-1/4" Length w/ nuts (NO STRINGER ON BACK OF SIGN)
 - 3/8" X 5" Length w/ nuts (STRINGERS ON BACK OF SIGN)
- RIVETS - 9/32" (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL
- O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH
- WASHERS (ALL POSTS) -
- 1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL
 - 1-1/4" O.D. X 3/8" I.D. X .080 NYLON

* Two different fastening systems are shown for illustration purposes. On any individual sign, either one or the other system shall be used. Actual number of fasteners per sign varies with the sign area, but normally there are two. For a single post installation, all signs greater than 9 sq. ft. require the use of 3 fasteners.

ATTACHMENT OF SIGNS TO POSTS	
WISCONSIN DEPT OF TRANSPORTATION	
APPROVED	<i>Matthew R. Rauch</i> For State Traffic Engineer
DATE 4/27/16	PLATE NO. A4-8.8

7

GENERAL NOTES

1. All 4 x 6 Wood Posts shall be modified by having two 1½" diameter holes drilled perpendicular to the roadway centerline.

7

**4 X 6 WOOD POST
MODIFICATIONS**

WISCONSIN DEPT OF TRANSPORTATION

APPROVED

Chester J. Spang
for State Traffic Engineer

DATE 3/27/97

PLATE NO. A4-11.2

PROJECT NO:

HWY:

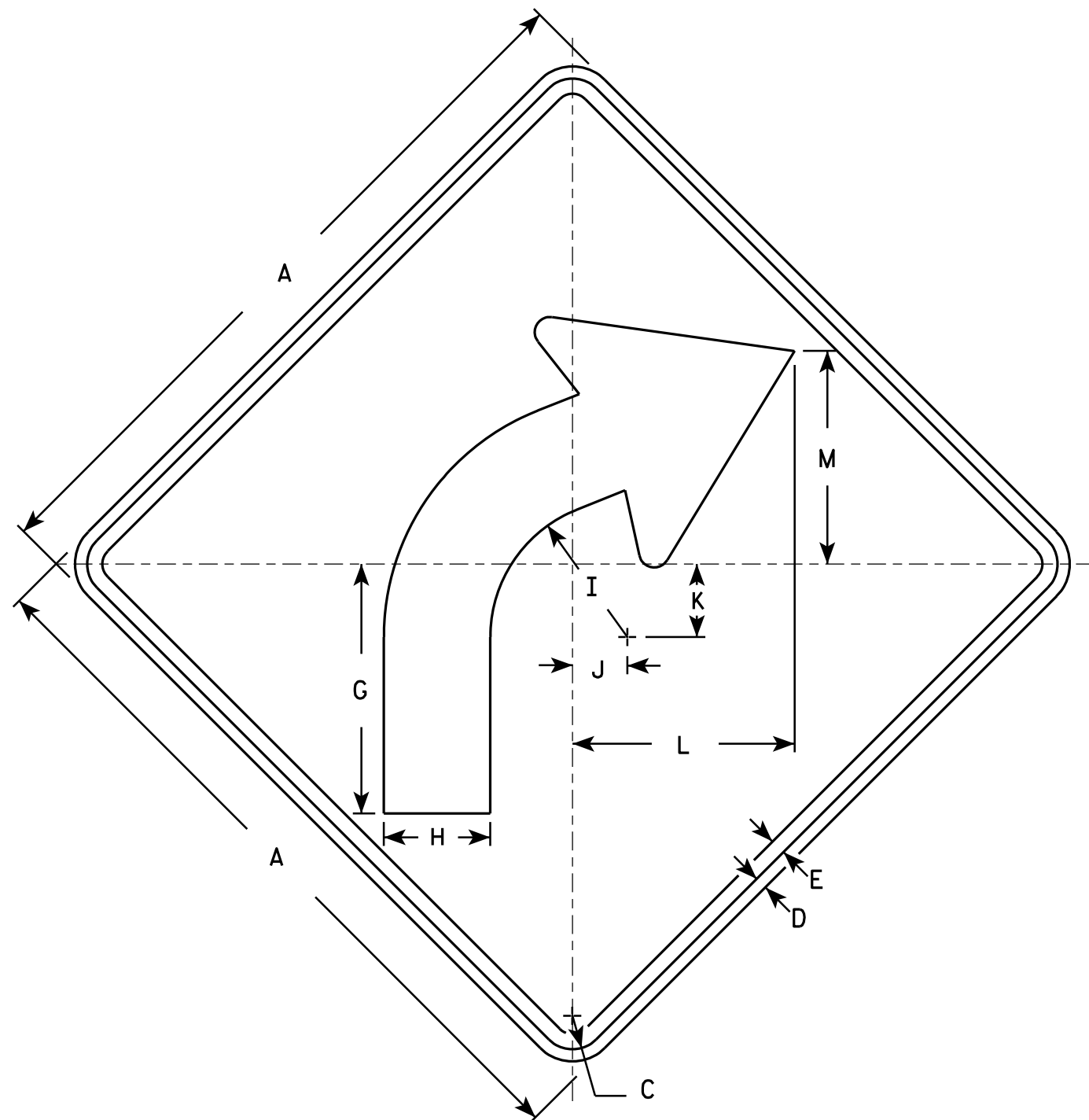
COUNTY:

SHEET NO:

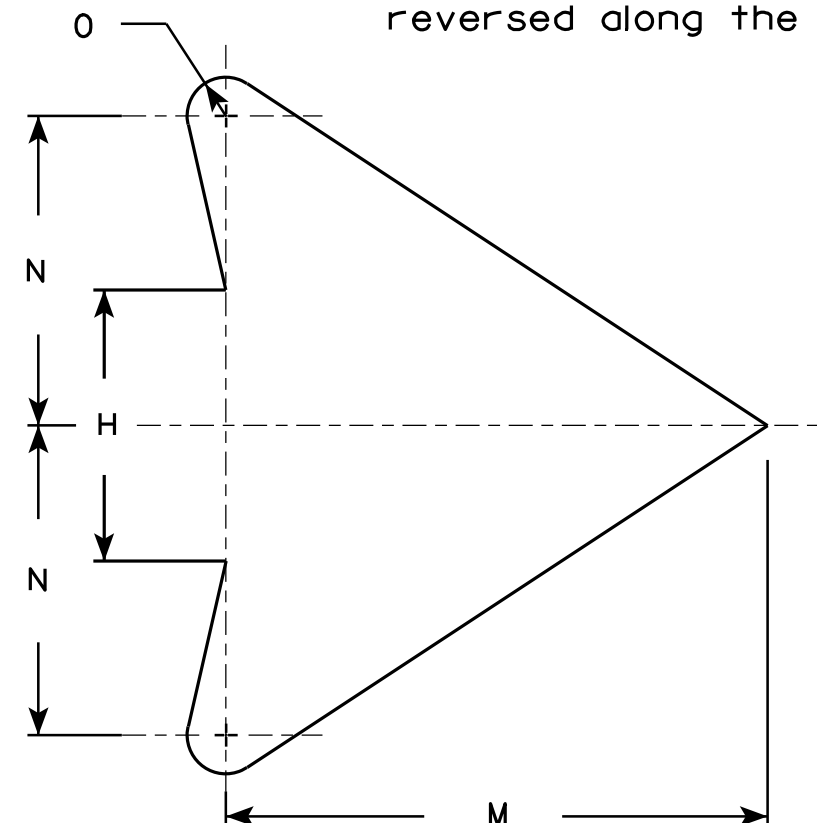
E

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Yellow
Message - Black
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
4. W1-2L is the same as W1-2R except the arrow is reversed along the vertical centerline.



W1-2R



ARROW DETAIL

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	24		1 1/8	3/8	1/2		8 1/4	3 1/2	4 1/2	1 3/4	2 3/8	7 1/4	7	4	1/2												4.0
2S	30		1 3/8	1/2	5/8		10 1/4	4 3/8	5 5/8	2 1/4	3	9 1/8	8 3/4	5	5/8												6.25
2M	36		1 5/8	5/8	3/4		12 3/8	5 1/4	6 3/4	2 5/8	3 1/2	10 7/8	10 1/2	6	3/4												9.0
3	36		1 5/8	5/8	3/4		12 3/8	5 1/4	6 3/4	2 5/8	3 1/2	10 7/8	10 1/2	6	3/4												9.0
4	36		1 5/8	5/8	3/4		12 3/8	5 1/4	6 3/4	2 5/8	3 1/2	10 7/8	10 1/2	6	3/4												9.0
5	48		2 1/4	3/4	1		16 1/2	7	9	3 1/2	4 5/8	14 1/2	14	8	1												16.0

STANDARD SIGN W1-2

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 5/15/12 PLATE NO. W1-2.10

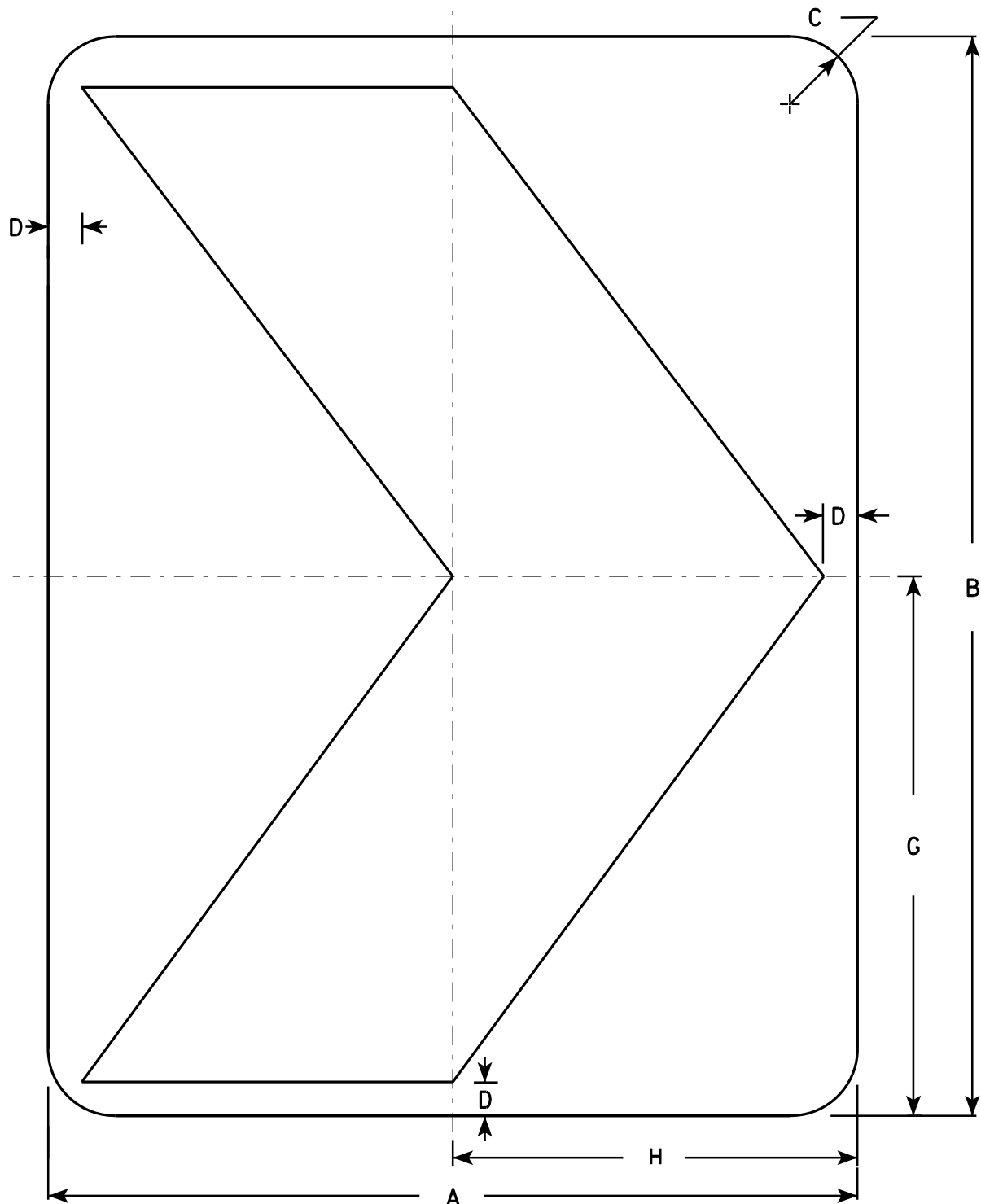
PROJECT NO:

HWY:

COUNTY:

SHEET NO:

E



NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Yellow
Message - Black
3. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.

W1-8

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	12	18	1 1/2	1/2			9	6																			1.5
2S	18	24	1 1/2	3/4			12	9																			3.0
2M	18	24	1 1/2	3/4			12	9																			3.0
3	24	30	1 1/2	1			15	12																			5.0
4	30	36	1 7/8	1 1/4			18	15																			7.5
5	36	48	2 1/4	1 1/2			24	18																			12.0

STANDARD SIGN

W1-8

WISCONSIN DEPT OF TRANSPORTATION

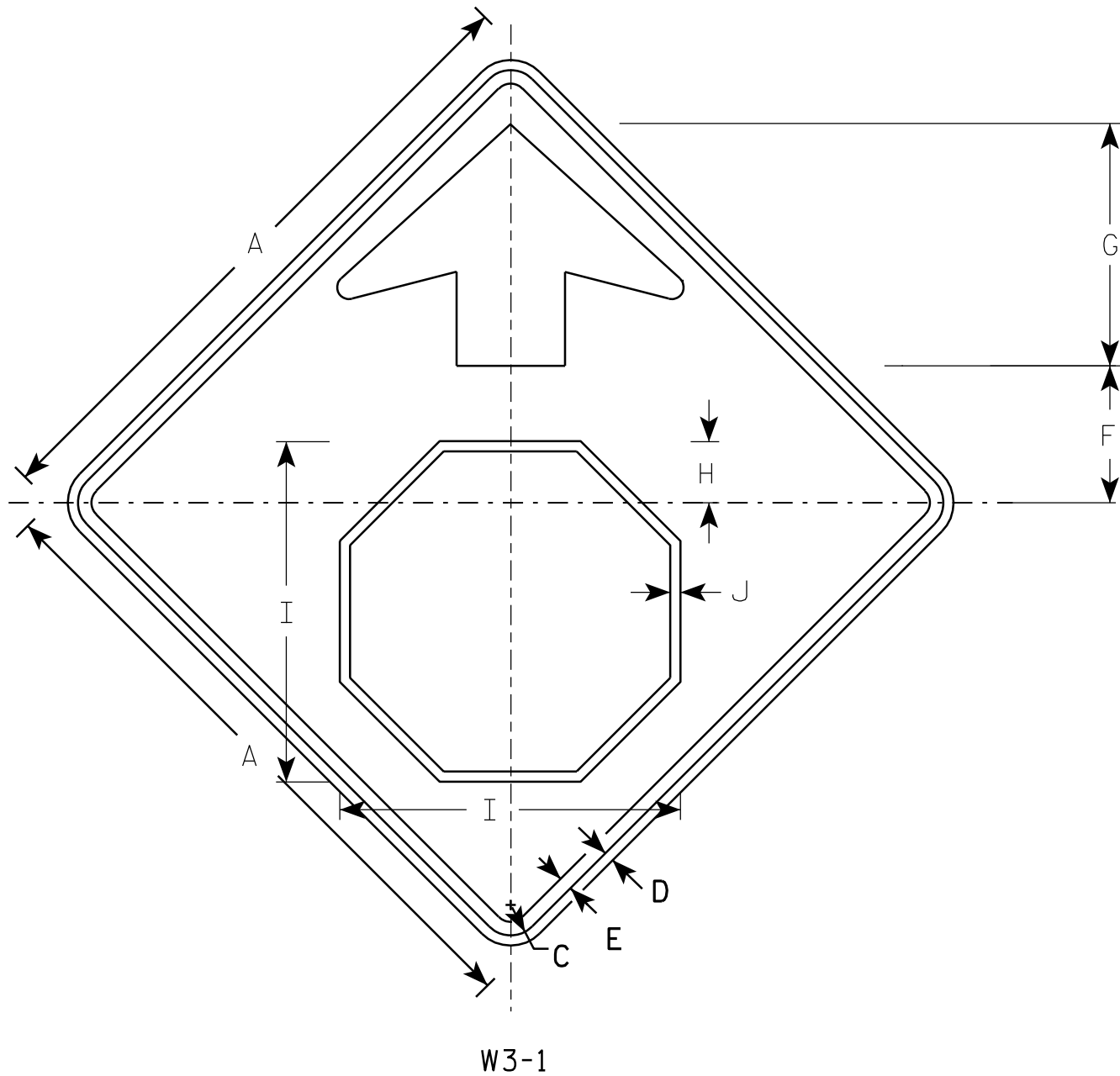
APPROVED *Matthew R. Rauch*
for State Traffic Engineer

DATE 6/7/10 PLATE NO. W1-8.6

PROJECT NO:

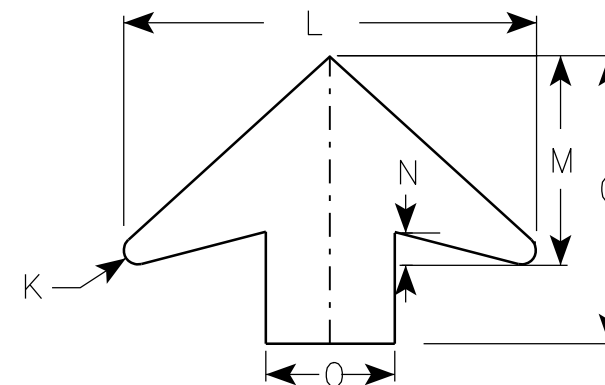
SHEET NO:

E



NOTES

1. All Signs Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - YELLOW
Arrow & Border - BLACK
Stop Symbol - WHITE BORDER ON RED BACKGROUND



ARROW DETAIL

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	30		1 3/8	1/2	5/8	6 1/4	11 1/4	2 7/8	15 3/4	1/2	1/2	16	8	1 1/4	5												6.25
2S	36		1 5/8	5/8	3/4	7 1/2	13 1/2	3 1/2	19	5/8	5/8	19 1/4	9 3/4	1 5/8	6												9.0
2M	36		1 5/8	5/8	3/4	7 1/2	13 1/2	3 1/2	19	5/8	5/8	19 1/4	9 3/4	1 5/8	6												9.0
3	36		1 5/8	5/8	3/4	7 1/2	13 1/2	3 1/2	19	5/8	5/8	19 1/4	9 3/4	1 5/8	6												9.0
4	48		2 1/4	3/4	1	10	17 7/8	4 1/2	25 1/8	3/4	7/8	25 5/8	13	2	8												16.0
5	48		2 1/4	3/4	1	10	17 7/8	4 1/2	25 1/8	3/4	7/8	25 5/8	13	2	8												16.0

PROJECT NO:

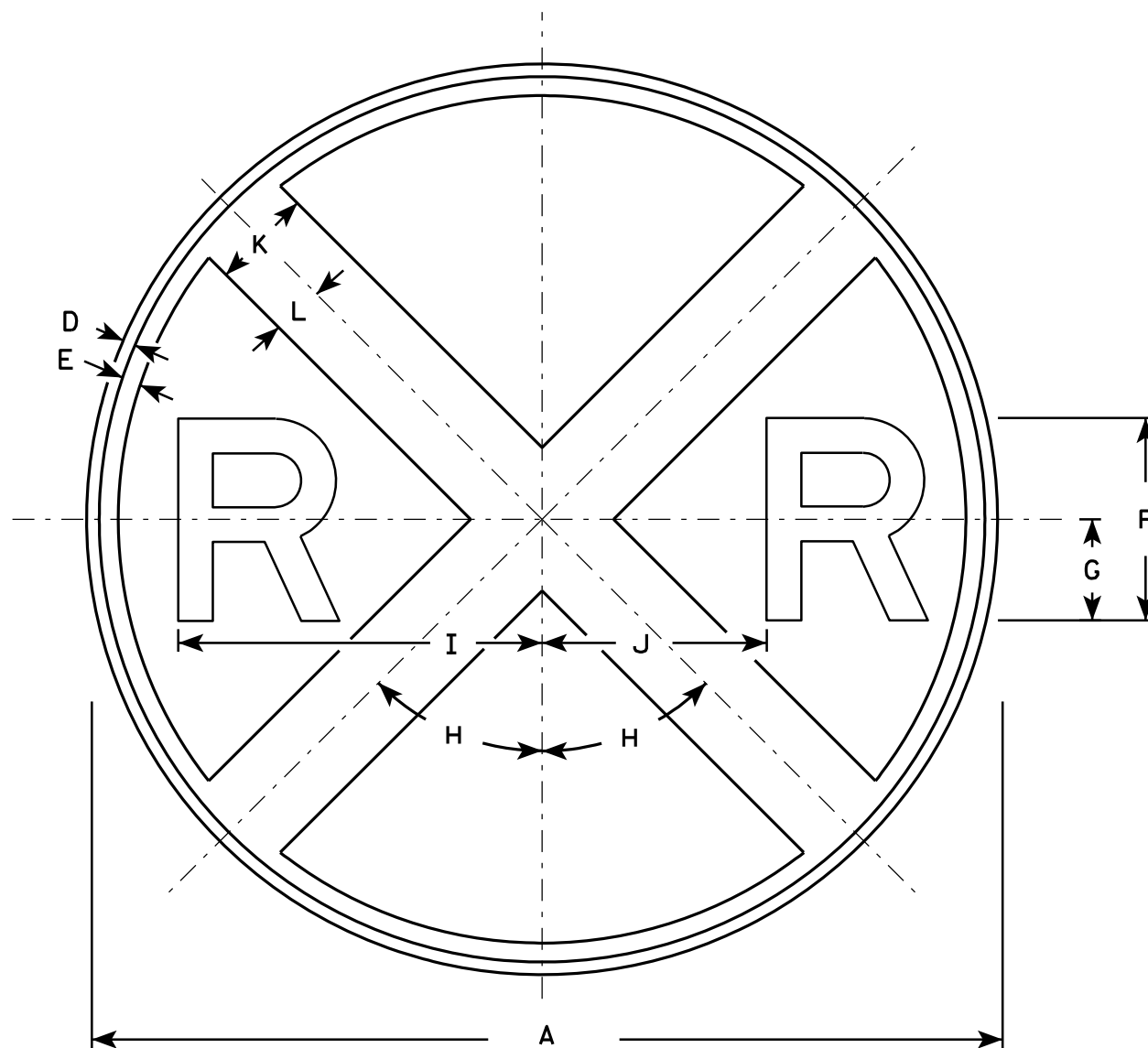
STANDARD SIGN
W3-1

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer
DATE 6/7/10 PLATE NO. W3-1.12

SHEET NO:

E



W10-1

NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Yellow
Message - Black
3. Message Series - E

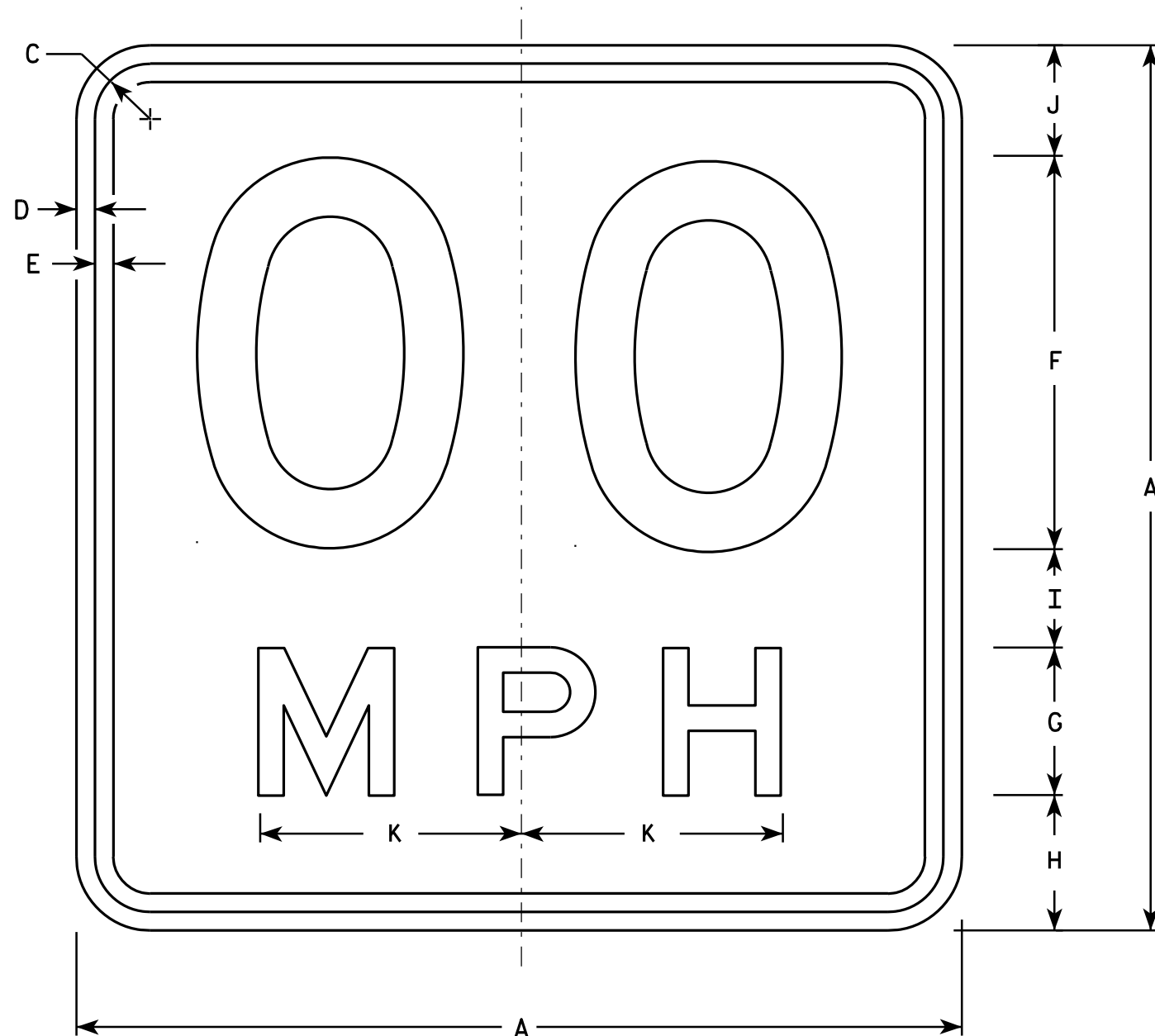
SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area sq. ft.
1	30			3⁄8	5⁄8	7	3 1⁄2	45°	12 3⁄8	7 1⁄8	3	1 1⁄2															4.91
2S	36			5⁄8	3⁄4	8	4	45°	14 3⁄8	8 5⁄8	4	2															7.07
2M	36			5⁄8	3⁄4	8	4	45°	14 3⁄8	8 5⁄8	4	2															7.07
3																											
4	48			3⁄4	1 1⁄4	10	5	45°	18 3⁄8	11 5⁄8	5	2 1⁄2															12.5
5																											

STANDARD SIGN W10-1

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
for State Traffic Engineer
DATE 3/13/13 PLATE NO. W10-1.8

PROJECT NO: _____ HWY: _____ COUNTY: _____ SHEET NO: **E**



NOTES

1. Sign is Type II - Type F Reflective - reference WIS DOT Standard Specification for HIGHWAY and STRUCTURE CONSTRUCTION latest edition.
2. Color:
Background - Yellow
Message - Black
3. Message Series - See Note 6
4. Corners may be square or rounded when base material is plywood but borders shall be rounded as shown. When base material is metal, the corners and borders shall be rounded.
5. Substitute appropriate numerals and optically space about centerline to achieve proper balance.
6. Line 1 is Series D
Line 2 is Series E

W13-1

- * For 30" x 30" Warning Signs, use 18" x 18" W13-1 signs.
For 36" x 36" Warning Signs, use 24" x 24" W13-1 signs.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Area Sq. Ft.
1	18		1 1/8	3/8	3/8	8	3	2 3/4	2	2 1/4	5 3/8																2.25
* 2S	18		1 1/8	3/8	3/8	8	3	2 3/4	2	2 1/4	5 3/8																2.25
* 2M	18		1 1/8	3/8	3/8	8	3	2 3/4	2	2 1/4	5 3/8																2.25
3	24		1 1/8	3/8	1/2	10	4	4	2 3/4	3 1/4	6 5/8																4.00
4	36		1 5/8	5/8	3/4	16	6	5 1/2	4	4 1/2	10 5/8																9.00
5	36		1 5/8	5/8	3/4	16	6	5 1/2	4	4 1/2	10 5/8																9.00

STANDARD SIGN

W13-1

WISCONSIN DEPT OF TRANSPORTATION

APPROVED *Matthew R. Rauch*
For State Traffic Engineer

DATE 5/31/12 PLATE NO. W13-1.16

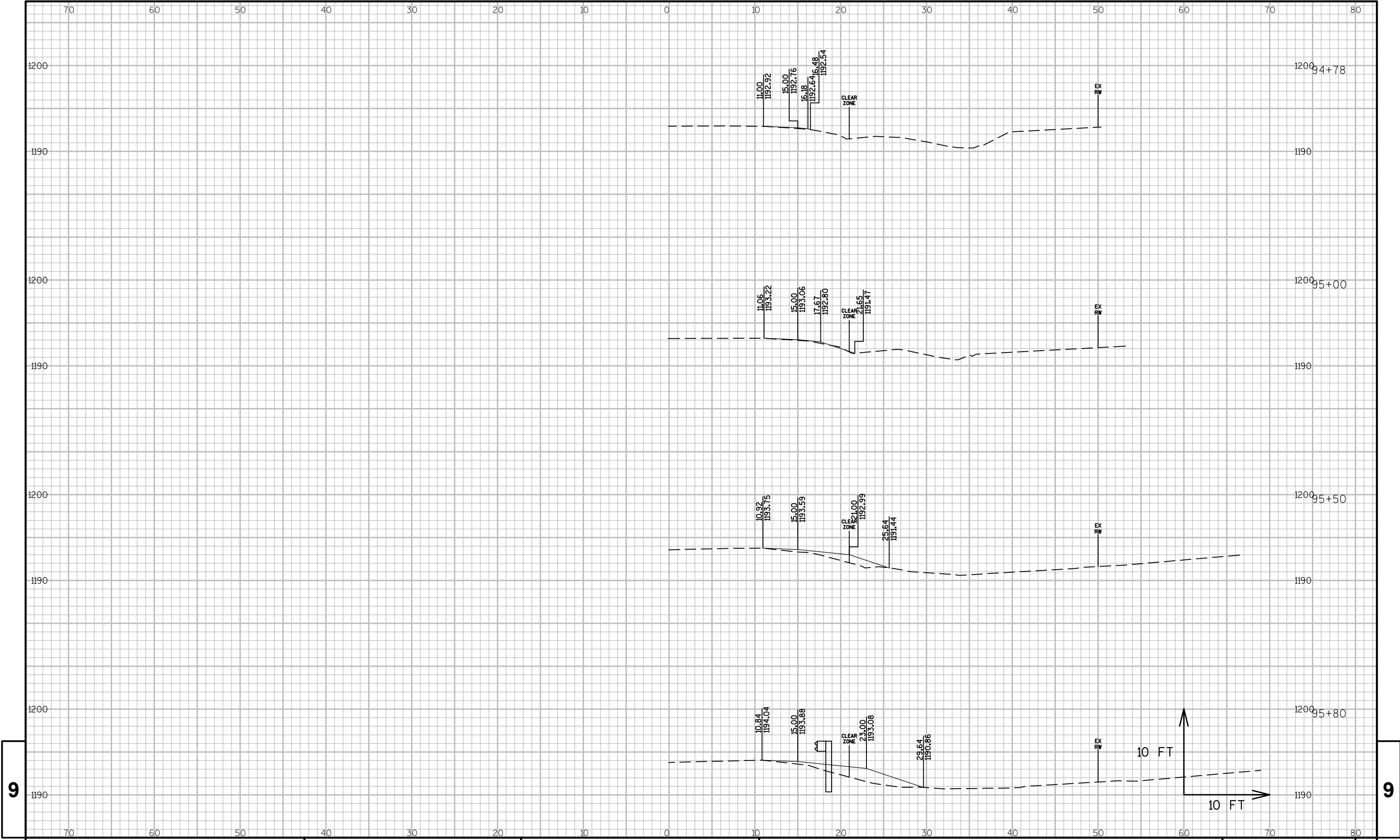
PROJECT NO:

HWY:

COUNTY:

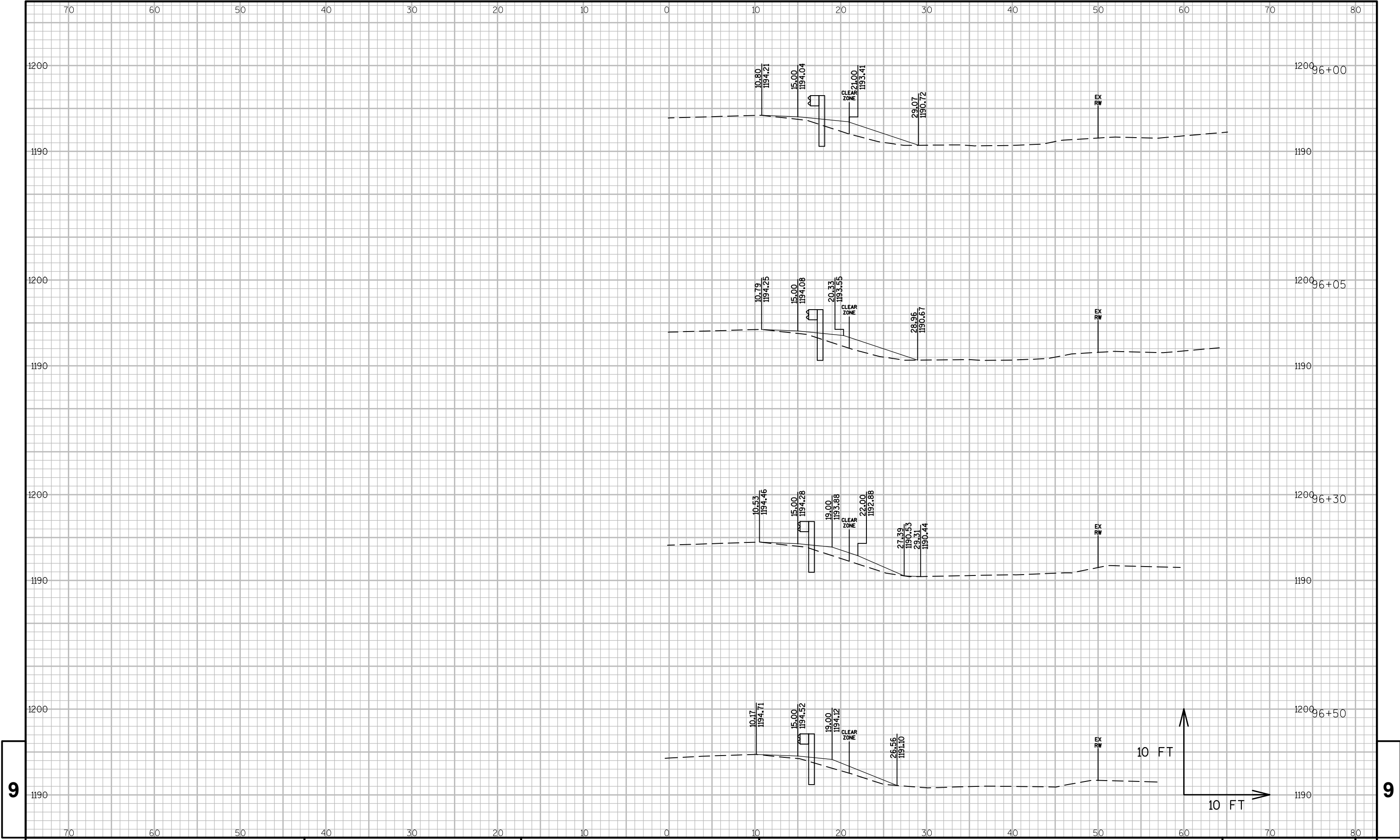
SHEET NO:

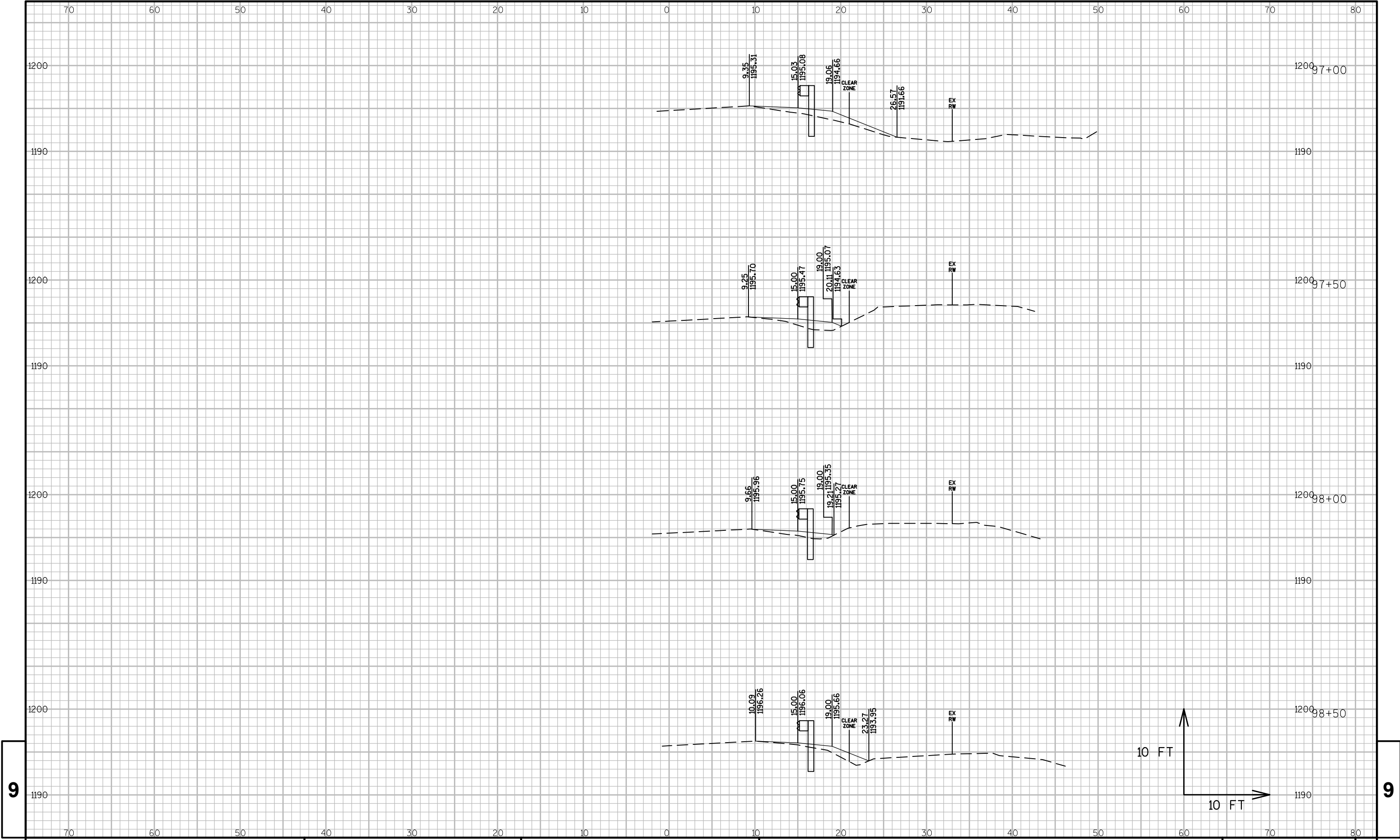
E



9

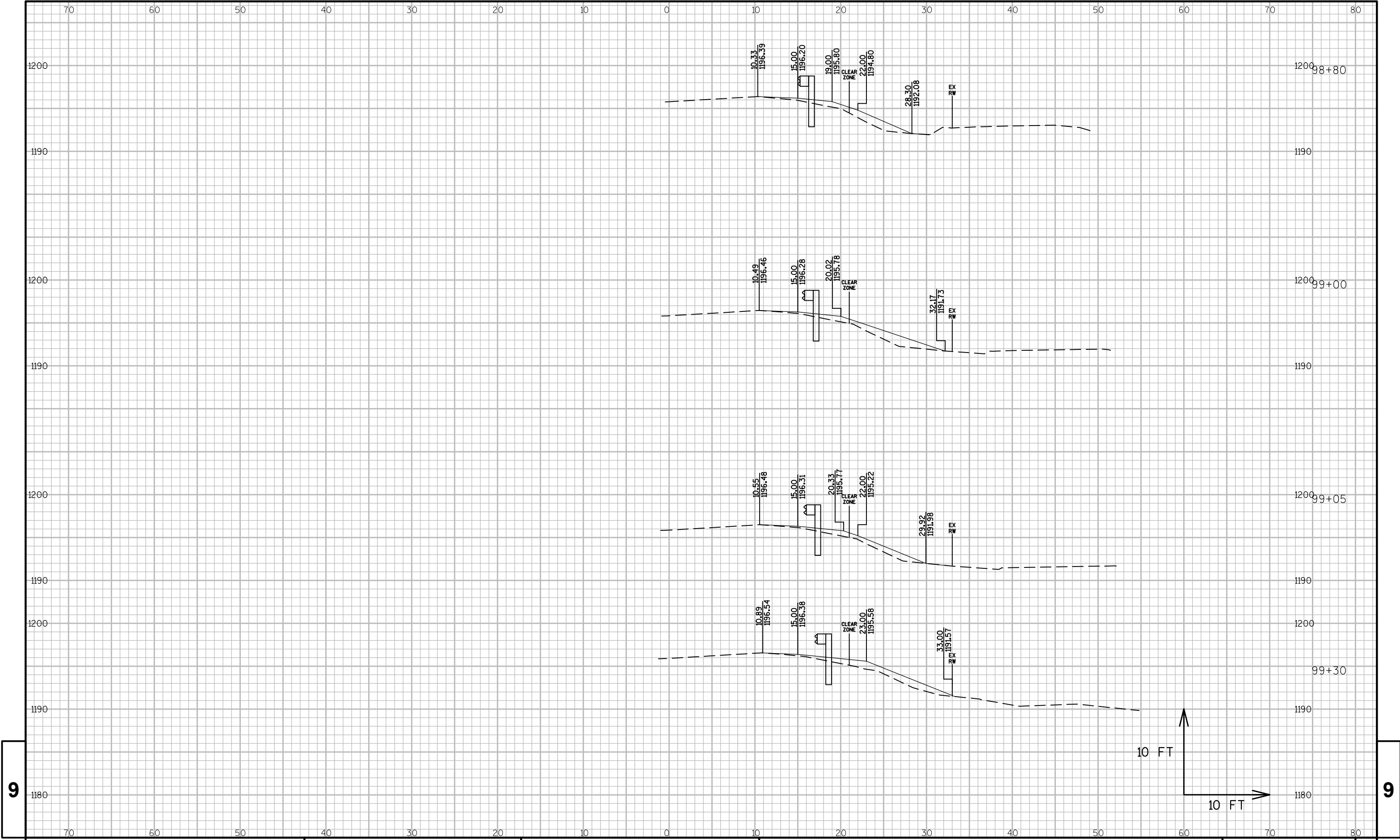
9

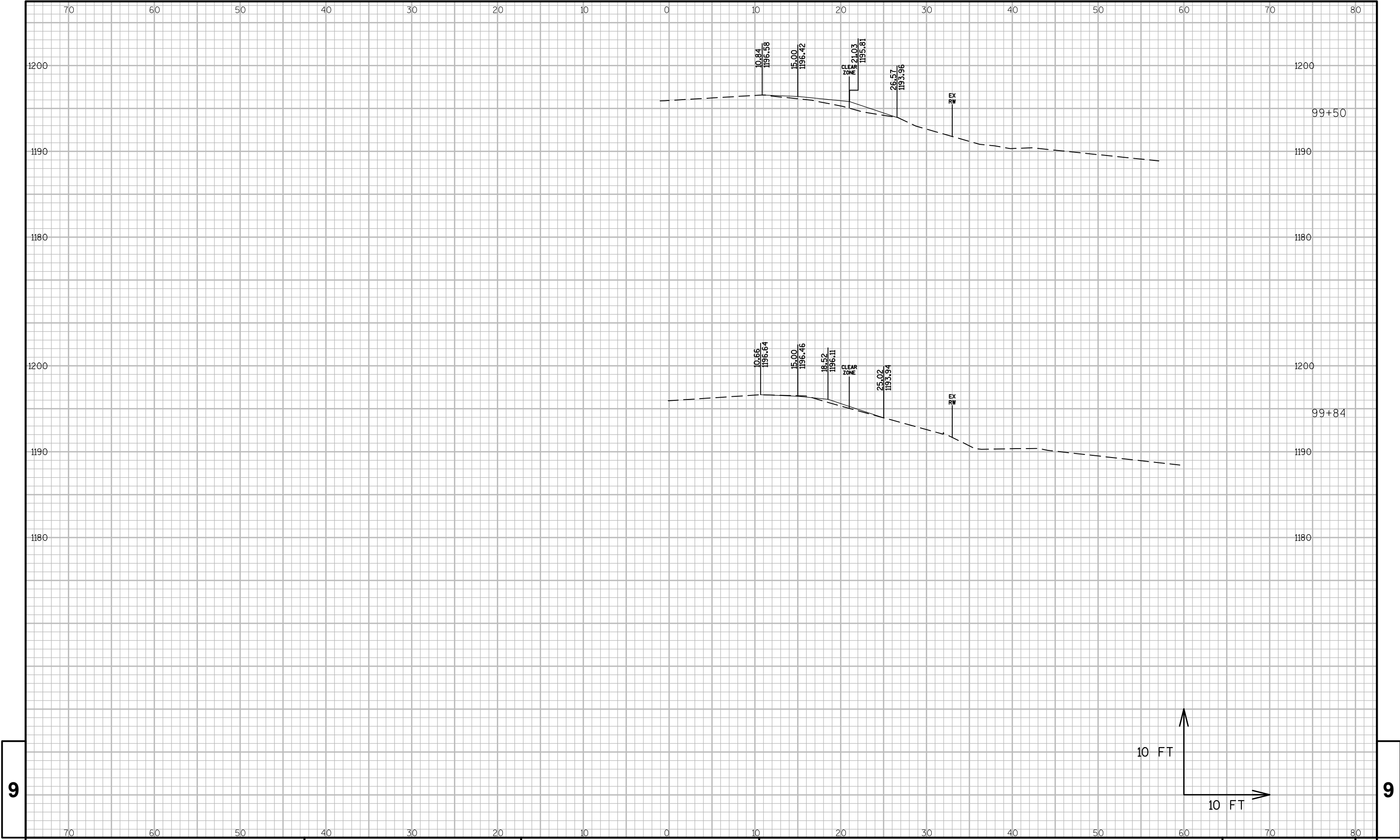


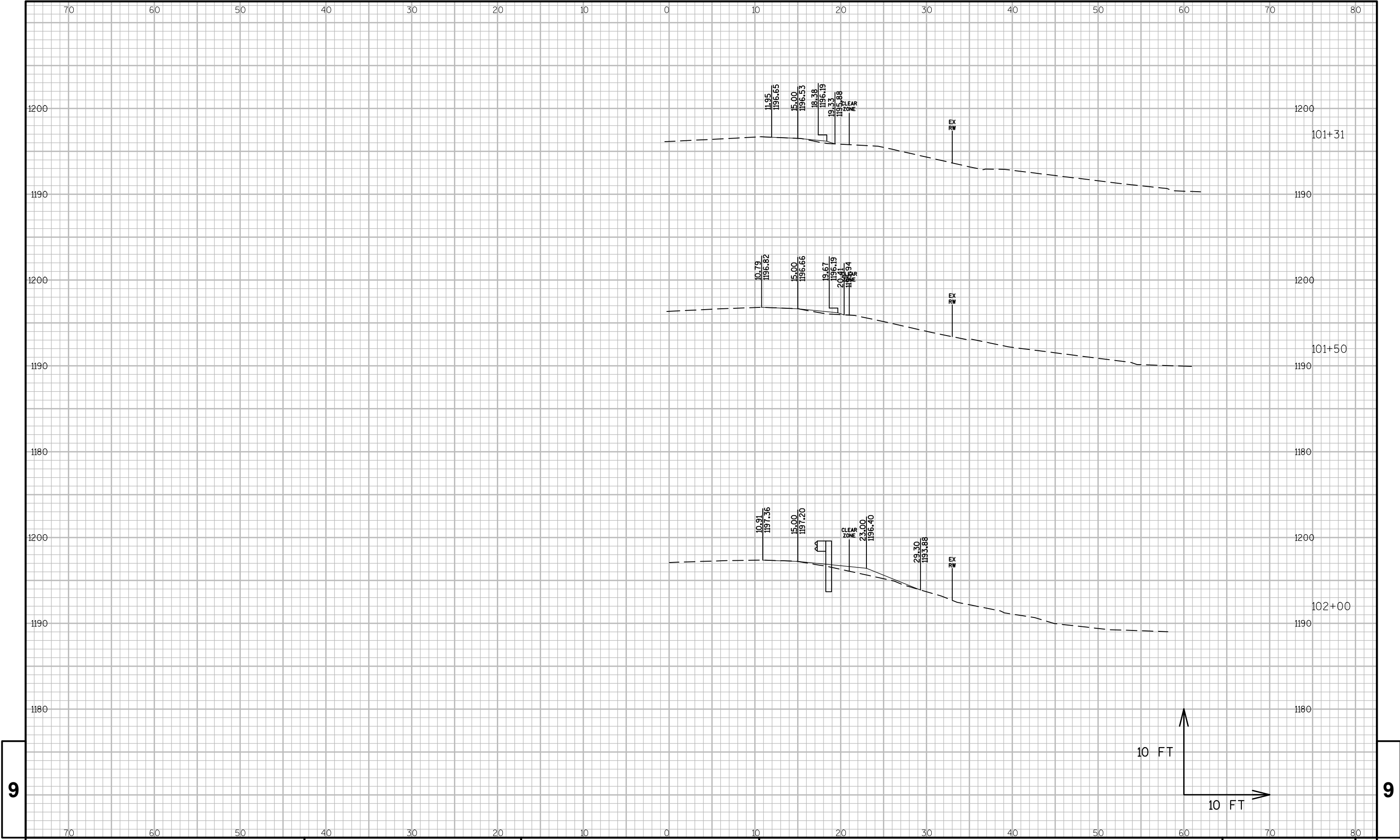


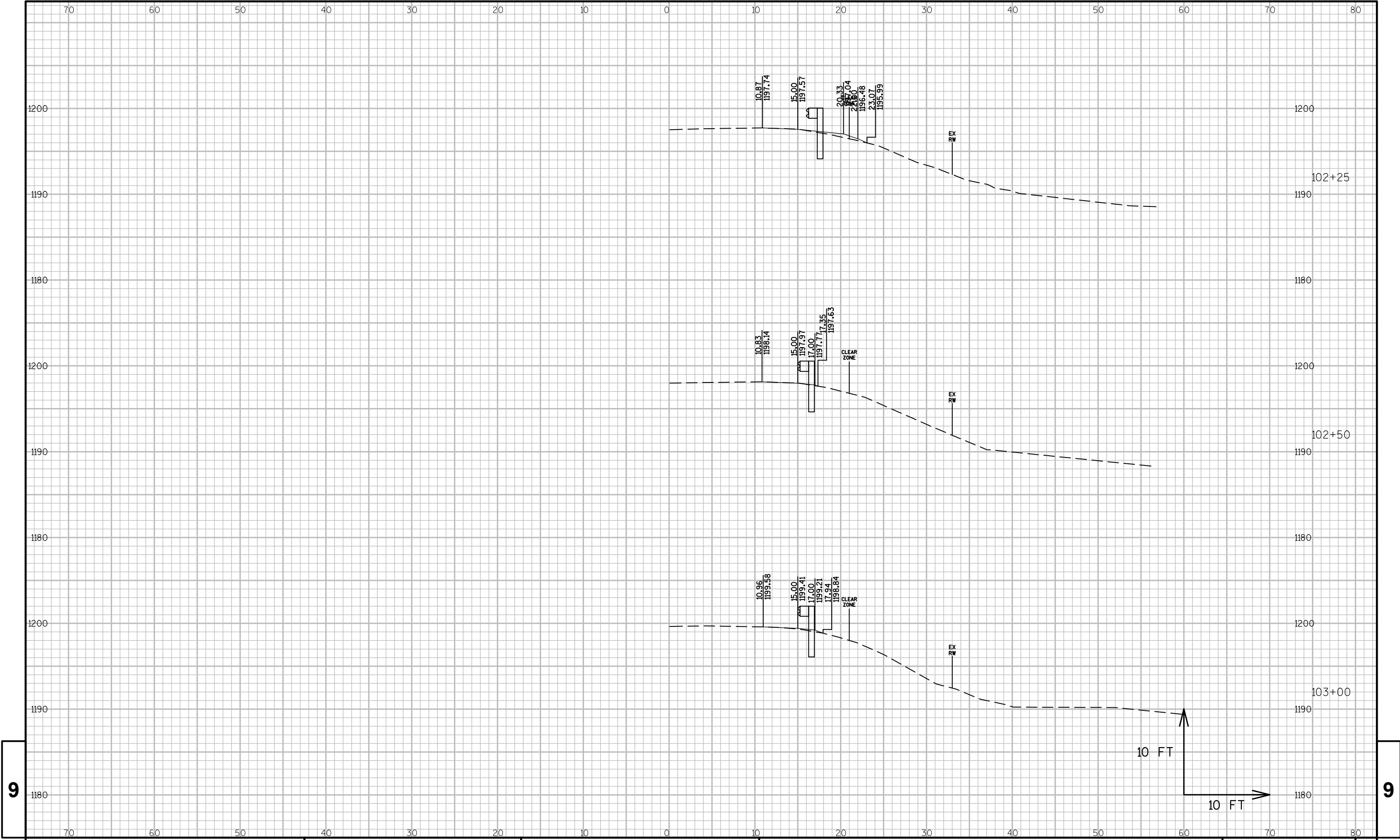
9

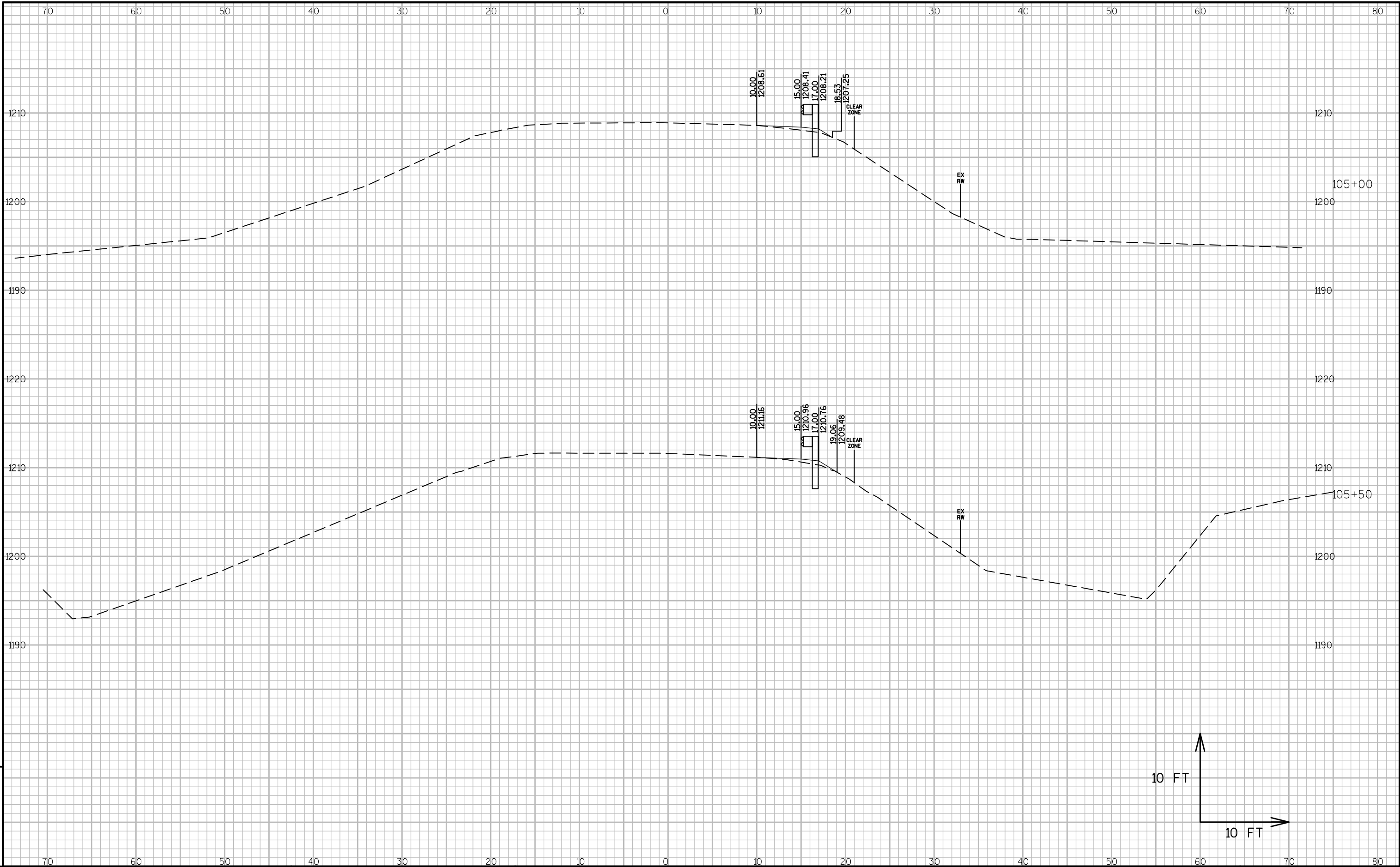
9





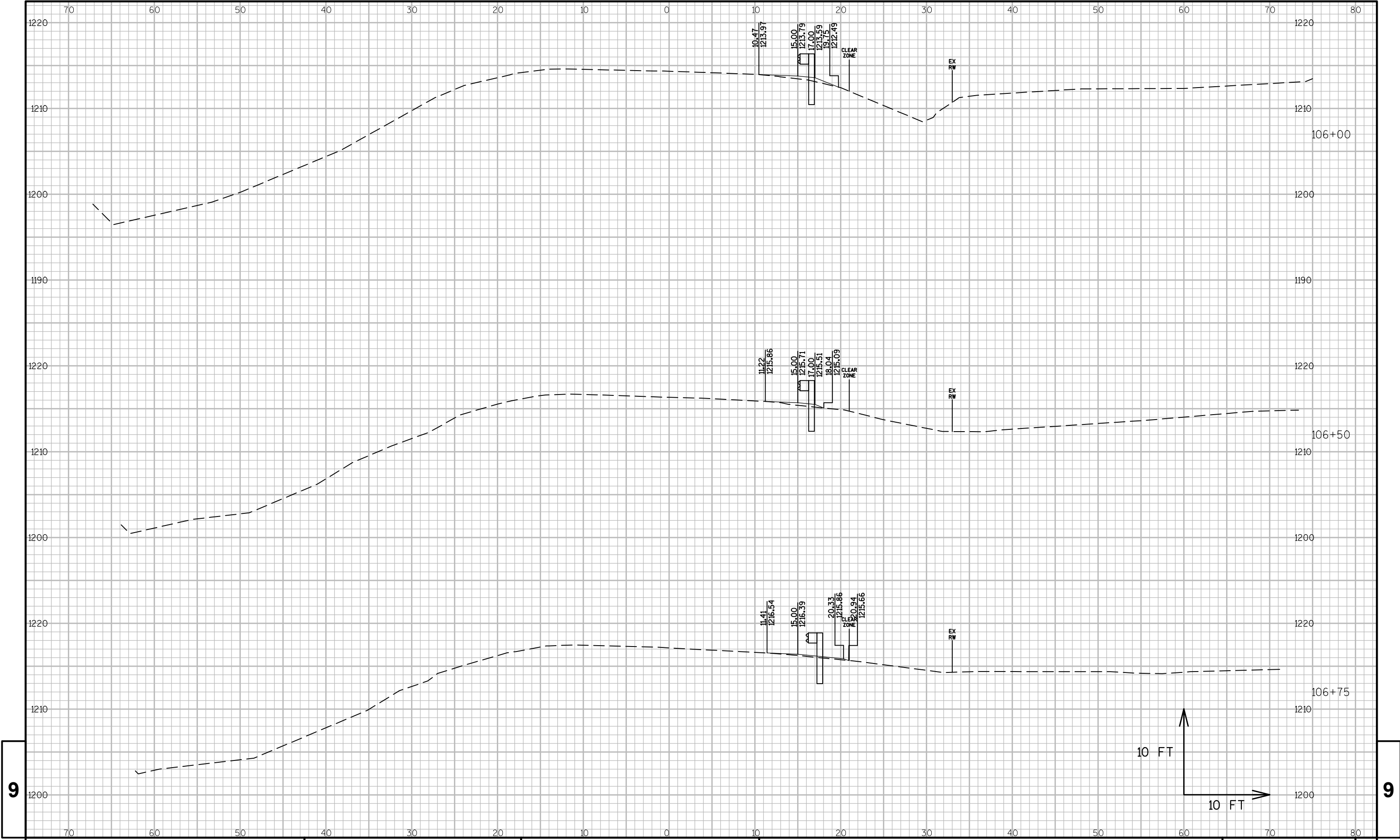




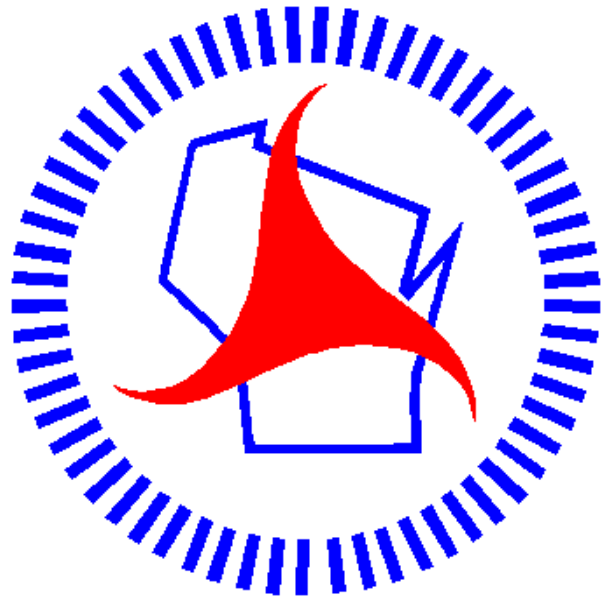


9

9



Notes



Wisconsin Department of Transportation

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through innovation and exceptional service.

<http://www.dot.wisconsin.gov>